

12may04 07:02:21 User259284 Session D2747.2

SYSTEM:OS - DIALOG OneSearch

File 155:MEDLINE(R) 1966-2004/May W1

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*File 155: Medline has been reloaded. Accession numbers have changed. Please see HELP NEWS 154 for details.

File 2:INSPEC 1969-2004/May W1

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*File 2: Alert feature enhanced for multiple files, duplicates removal, customized scheduling. See HELP ALERT.

File 5:Biosis Previews(R) 1969-2004/May W1

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File 6:NTIS 1964-2004/May W2

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File 8:Ei Compendex(R) 1970-2004/May W1

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File 73:EMBASE 1974-2004/May W1

(c) 2004 Elsevier Science B.V.

File 987:TULSA (Petroleum Abs) 1965-2004/May W3

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File 94:JICST-EPlus 1985-2004/Apr W3

(c) 2004 Japan Science and Tech Corp (JST)

File 35:Dissertation Abs Online 1861-2004/Apr

(c) 2004 ProQuest Info&Learning

File 144:Pascal 1973-2004/May W1

(c) 2004 INIST/CNRS

File 105:AESIS 1851-2001/Jul

(c) 2001 Australian Mineral Foundation Inc

*File 105: This file is closed (no updates)

File 99:Wilson Appl. Sci & Tech Abs 1983-2004/Apr

(c) 2004 The HW Wilson Co.

File 58:GeoArchive 1974-2004/Nov

(c) 2004 Geosystems

*File 58: The update code has been incremented to reflect this ren
this file's level of currency.

File 34:SciSearch(R) Cited Ref Sci 1990-2004/May W1

(c) 2004 Inst for Sci Info

File 434:SciSearch(R) Cited Ref Sci 1974-1989/Dec

(c) 1998 Inst for Sci Info

File 292:GEOBASE(TM) 1980-2004/May B1

(c) 2004 Elsevier Science Ltd.

File 89:GeoRef 1785-2004/May B1

(c) 2004 American Geological Institute

*File 89: Truncate SH codes for a complete retrieval.

File 65:Inside Conferences 1993-2004/May W2

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File 350:Derwent WPIX 1963-2004/UD,UM &UP=200428

(c) 2004 Thomson Derwent

*File 350: For more current information, include File 331 in your search.

Enter HELP NEWS 331 for details.

File 347:JAPIO Nov 1976-2003/Dec(Updated 040402)

(c) 2004 JPO & JAPIO

*File 347: JAPIO data problems with year 2000 records are now fixed.

Alerts have been run. See HELP NEWS 347 for details.

Set	Items	Description
S1	250373	ISOTROP?????
S2	544254	HIGH() RESOLUTION??
S3	664565	(HIGH OR HIGHER OR HIGHEST OR IMPROVED OR BETTER OR ENHAN- C?????) (2N) RESOLUTION??
S4	3267	1AND2
S5	3964	1AND3
S6	175	S5 AND VOXEL??
S7	731	S5 AND ((THREE OR 3) () (D OR DIMENSION???? OR AXIS OR AXES)

STIC

NPC Search

Databases History &
Results

May 12th 2004

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      OR 3D)
S8      116  6AND7
S9      196  S7 AND VOLUM???????
S10     197  S8:S9 AND (MRI OR IMAGING)
S11     100  S8:S9 AND CONTRAST?????
S12     197  S8:S9 AND (IMAGE OR IMAGES OR IMAGED)
S13      7   S8:S9 AND (FORMATION OR FORMING OR CREATING OR CREATION)
S14     223  S10 OR S12
S15      87  11AND14
S16      93  S13 OR S15
S17      49  RD S16 (unique items)
S18      79  S6:S7 AND (MATRIX???? OR MATRICES OR ARRAY????)
S19      4   S18 AND ORTHOGON???????
S20      14  S18 AND SLICE???
S21      26  S18 AND SCANN????
S22      0   S18 AND UNKNOWN???
S23      8   S18 AND RELATIVE??
S24      1   S18 AND RELATION
S25      2   S18 AND RESPECT
S26      6   S17 AND (MATRIX???? OR MATRICES OR ARRAY????)
S27      45  S13 OR S19:S26
S28      27  RD S27 (unique items)
S29      15  S11:S21 AND ISOTROP???????/TI
S30      13  S29 NOT S27
S31      5   RD S30 (unique items)

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09/549524

28/9/1 (Item 1 from file: 155)
DIALOG(R) File 155: MEDLINE(R)
(c) format only 2004 The Dialog Corp. All rts. reserv.

14148752 PMID: 9847598
[FASE (fast advanced spin echo)]
Higashi M
Toshiba Medical Systems Co., LTD.
Nippon rinsho. Japanese journal of clinical medicine (JAPAN) Nov 1998,
56 (11) p2783-91, ISSN 0047-1852 Journal Code: 0420546
Document type: Journal Article; Review; Review, Tutorial; English
Abstract
Languages: JAPANESE
Main Citation Owner: NLM
Record type: Completed
Subfile: INDEX MEDICUS
RF-refocused single or multi-shot EPI provides high-contrast 2D or
3D T2-weighted images in a very short scan time. Applications
include MR cholangiopancreatography, MR myelography, imaging detailed
structures of the internal auditory canal and in situations in which very
fast T2 imaging is required. FASE offers both 2D and 3D
techniques. 2D FASE technique permits high-resolution
images of 384 matrix or more to be obtained at 2 to 3 seconds
per image. It is easy to perform and suitable for screening. 3D
FASE permits acquisition of isotropic voxels, allowing
high-resolution viewing from any desired direction by
post-processing (MIP and/or MPR). This technique is best suited to detailed
examinations in which multiple projection angles will be reconstructed or
high-resolution diagnosis of source images. (20 Refs.)
Tags: Human
Descriptors: Image Enhancement--methods--MT; *Magnetic Resonance
Imaging--methods--MT
Record Date Created: 19990224
Record Date Completed: 19990224

Received
From
STIC
5/12/2004
TAC

28/9/2 (Item 2 from file: 155)
DIALOG(R) File 155: MEDLINE(R)
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13871707 PMID: 9572523
High-resolution 3D Bayesian image reconstruction using
the microPET small-animal scanner.
Qi J; Leahy R M; Cherry S R; Chatziioannou A; Farquhar T H
Signal and Image Processing Institute, University of Southern California,
Los Angeles 90089-2564, USA.
Physics in medicine and biology (ENGLAND) Apr 1998, 43 (4) p1001-13,
ISSN 0031-9155 Journal Code: 0401220
Contract/Grant No.: R01 CA579794; CA; NCI; R01 CA69370; CA; NCI
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: Completed
Subfile: INDEX MEDICUS
A Bayesian method is described for reconstruction of high-
resolution 3D images from the microPET small-animal
scanner. Resolution recovery is achieved by explicitly modelling the
depth dependent geometric sensitivity for each voxel in combination
with an accurate detector response model that includes factors due to
photon pair non-collinearity and inter-crystal scatter and penetration. To
reduce storage and computational costs we use a factored matrix in
which the detector response is modelled using a sinogram blurring kernel.
Maximum a posteriori (MAP) images are reconstructed using this model in
combination with a Poisson likelihood function and a Gibbs prior on the
image. Reconstructions obtained from point source data using the accurate
system model demonstrate a potential for near-isotropic FWHM
resolution of approximately 1.2 mm at the center of the field of view

compared with approximately 2 mm when using an analytic 3D reprojection (3DRP) method with a ramp filter. These results also show the ability of the accurate system model to compensate for resolution loss due to crystal penetration producing nearly constant radial FWHM resolution of 1 mm out to a 4 mm radius. Studies with a point source in a uniform cylinder indicate that as the resolution of the image is reduced to control noise propagation the resolution obtained using the accurate system model is superior to that obtained using 3DRP at matched background noise levels. Additional studies using pie phantoms with hot and cold cylinders of diameter 1-2.5 mm and 18FDG animal studies appear to confirm this observation.

NA TAF
5/10/2004

Tags: Support, U.S. Gov't, P.H.S.

Descriptors: *Image Processing, Computer-Assisted--methods--MT; *Phantoms, Imaging; *Tomography, Emission-Computed--instrumentation--IS; *Tomography, Emission-Computed--methods--MT; Animals; Bayes Theorem; Brain--radionuclide imaging--RI; Haplorhini; Likelihood Functions; Miniaturization; Poisson Distribution; Reproducibility of Results; Sensitivity and Specificity

Record Date Created: 19980616

Record Date Completed: 19980616

28/9/3 (Item 3 from file: 155)

DIALOG(R)File 155:MEDLINE(R)

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13667403 PMID: 9379202

Performance evaluation of a whole-body PET scanner using the NEMA protocol. National Electrical Manufacturers Association.

Brix G; Zaers J; Adam L E; Bellemann M E; Ostertag H; Trojan H; Haberkorn U; Doll J; Oberdorfer F; Lorenz W J

Research Program Radiological Diagnostics and Therapy, German Cancer Research Center (DKFZ), Heidelberg, Germany.

Journal of nuclear medicine - official publication, Society of Nuclear Medicine (UNITED STATES) Oct 1997, 38 (10) p1614-23, ISSN 0161-5505

Journal Code: 0217410

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: Completed

Subfile: INDEX MEDICUS

This study evaluates the performance of the newly developed high-resolution whole-body PET scanner ECAT EXACT HR+. METHODS: The scanner consists of four rings of 72 bismuth germanate block detectors each, covering an axial field of view of 15.5 cm with a patient port of 56.2 cm. A single block detector is divided into an 8 x 8 matrix, giving a total of 32 rings with 576 detectors each. The dimensions of a single detector element are 4.39 x 4.05 x 30 mm³. The scanner is equipped with extendable tungsten septa for two-dimensional two-dimensional measurements, as well as with three ⁶⁸Ge line sources for transmission scans and daily quality control. The spatial resolution, scatter fraction, count rate, sensitivity, uniformity and accuracy of the implemented correction algorithms were evaluated after the National Electrical Manufacturers Association protocol using the standard acquisition parameters. RESULTS: The transaxial resolution in the two-dimensional mode is 4.3 mm (4.4 mm) in the center and increases to 4.7 mm (4.8 mm) tangential and to 8.3 mm (8.0 mm) radial at a distance of r = 20 cm from the center. The axial slice width measured in the two-dimensional mode varies between 4.2 and 6.6 mm FWHM over the transaxial field of view. In the three-dimensional mode the average axial resolution varies between 4.1 mm FWHM in the center and 7.8 mm at r = 20 cm. The scatter fraction is 17.1% (32.5%) for a lower energy discriminator level of 350 keV. The maximum true event count rate of 263 (345) kcps was measured at an activity concentration of 142 (26.9) kBq/ml. The total system sensitivity for true events is 5.7 (27.7) cps/Bq/ml. From the uniformity measurements, we obtained a volume variance of 3.9% (5.0%) and a system variance of 1.6% (1.7%). The implemented three-

dimensional scatter correction algorithm reveals very favorable properties, whereas the three-dimensional attenuation correction yields slightly inaccurate results in low- and high-density regions. CONCLUSION: The ECAT EXACT HR+ has an excellent, nearly isotropic spatial resolution, which is advantageous for brain and small animal studies. While the relatively low slice sensitivity may hamper the capability for performing fast dynamic two-dimensional studies, the scanner offers a sufficient sensitivity and count rate capacity for fully three-dimensional whole-body imaging.

Tags: Female; Human

Descriptors: *Gamma Cameras--standards--ST; *Tomography, Emission-Computed--instrumentation--IS; Adenocarcinoma, Follicular--radionuclide imaging--RI; Adenocarcinoma, Follicular--secondary--SC; Algorithms; Animals; Brain Neoplasms--radionuclide imaging--RI; Brain Neoplasms--secondary--SC; Equipment Design; Evaluation Studies; Image Processing, Computer-Assisted; Lung Neoplasms--radionuclide imaging--RI; Lung Neoplasms--secondary--SC; Sensitivity and Specificity; Thyroid Neoplasms--pathology--PA; Thyroid Neoplasms--radionuclide imaging--RI; Tomography, Emission-Computed--standards--ST

Record Date Created: 19971110

Record Date Completed: 19971110

28/9/4 (Item 4 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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13189088 PMID: 8858769

Gadolinium-enhanced three-dimensional MR angiography of the thoracoabdominal aorta.

Krinsky G; Weinreb J

Department of Radiology, New York University Medical Center, NY 10016, USA.

Seminars in ultrasound, CT, and MR (UNITED STATES) Aug 1996, 17 (4)
p280-303, ISSN 0887-2171 Journal Code: 8504689

Document type: Journal Article; Review; Review, Tutorial

Languages: ENGLISH

Main Citation Owner: NLM

Record type: Completed

Subfile: INDEX MEDICUS

MR angiography (MRA) of the thoracoabdominal aorta is a noninvasive technique that can rapidly acquire a volume of data with the capability of multiplanar reformations (MPR) and "bright blood" maximum intensity projection (MIP) angiographic images. These MIP images can display long tortuous vessels in a single three-dimensional (3D) volume, with excellent delineation of branch vessel diseases and without the flow artifacts or long examination times of conventional spin-echo (SE) imaging. Two-dimensional (2D) time-of-flight (TOF) imaging is used most widely because of familiarity and ease of implementation, but this method has limitations in evaluating thoracoabdominal aortic disease. Sequential 2D axial imaging (which maximizes flow-related enhancement) is time consuming, subject to slice-to-slice misregistration, and can be degraded by pulsatile and turbulent flow. Coronal or parasagittal imaging is more time efficient, but image degradation secondary to in plane saturation and stagnant or turbulent flow from aneurysmal disease may lead to nondiagnostic studies. Three-dimensional TOF techniques offer the advantages of higher signal-to-noise ratio, better spatial resolution with near isotropic voxels, and shorter echo times (TEs), which lessen signal loss because of intravoxel phase dispersion. Although these techniques provide excellent image quality in the carotid arteries, they are of limited use in the aorta because of saturation effects. However, the addition of gadolinium chelates shortens the T1 relaxation rate of blood, which obviates the need for flow-related enhancement, allowing for inplane imaging without saturation effects, even in regions of virtually stagnant flow. The enormous signal enhancement of gadolinium chelates enables imaging with high-resolution

matrices, providing diagnostic angiograms in as little as 2 minutes. With improved hardware, faster and stronger gradients, and phased-array coils that increase the signal-to-noise ratio, breath-hold gadolinium-enhanced 3D schemes with ultrashort TEs will become the optimal method for imaging the aorta and its branch vessels. Using this technique, the aorta can be imaged in less than 1 minute. (19 Refs.)

Tags: Human

Descriptors: *Aorta, Abdominal--pathology--PA; *Aorta, Thoracic--pathology--PA; *Gadolinium--diagnostic use--DU; *Magnetic Resonance Angiography--methods--MT; *Vascular Diseases--diagnosis--DI; Aorta, Abdominal--anatomy and histology--AH; Aorta, Thoracic--anatomy and histology--AH; Electrocardiography; Respiration; Vascular Diseases--radiography--RA

CAS Registry No.: 7440-54-2 (Gadolinium)

Record Date Created: 19970114

Record Date Completed: 19970114

28/9/5 (Item 5 from file: 155)

DIALOG(R) File 155:MEDLINE(R)

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12497201 PMID: 12964308

Thermoacoustic molecular imaging of small animals.

Kruger Robert A; Kiser William L; Reinecke Daniel R; Kruger Gabe A; Miller Kathy D

OptoSonics, Inc., 7210 Georgetown Road, Suite 400, Indianapolis, IN 46268, USA. rkruger@optosonics.com

Molecular imaging - official journal of the Society for Molecular Imaging (United States) Apr 2003, 2 (2) p113-23, ISSN 1535-3508

Journal Code: 101120118

Contract/Grant No.: CA65744; CA; NCI

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: Completed

Subfile: INDEX MEDICUS

We have designed, constructed, and tested a thermoacoustic computed tomography (TCT) scanner for imaging optical absorption in small animals in three dimensions. The device utilizes pulsed laser irradiation (680-1064 nm) and a unique, 128-element transducer array. We quantified the isotropic spatial resolution of this scanner to be 0.35 mm. We describe a dual-wavelength subtraction technique for isolating optical dyes with TCT. Phantom experiments demonstrate that we can detect 5 fmol of a near-infrared dye (indocyanine green, ICG) in a 1-microl volume using dual-wavelength subtraction. Initial TCT imaging in phantoms and in two sacrificed mice suggests that three-dimensional, optical absorption patterns in small animals can be detected with an order of magnitude better spatial resolution and an order of magnitude better low-contrast detectability in small animals when compared to fluorescence imaging or diffusion optical tomography.

Tags: Support, U.S. Gov't, P.H.S.

Descriptors: Image Processing, Computer-Assisted--instrumentation

--IS; *Image Processing, Computer-Assisted--methods--MT; *Tomography, X-Ray Computed--methods--MT; Algorithms; Animals; Brain--metabolism--ME; Diffusion; Dose-Response Relationship, Drug; Dyes--pharmacology--PD; Indocyanine Green--pharmacology--PD; Kinetics; Linear Models; Mice; Microscopy, Fluorescence; Phantoms, Imaging; Temperature

CAS Registry No.: 0 (Dyes); 3599-32-4 (Indocyanine Green)

Record Date Created: 20030910

Record Date Completed: 20031014

28/9/6 (Item 6 from file: 155)

DIALOG(R) File 155:MEDLINE(R)

*Done No Good
TAF
5/12/2004*

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12031970 PMID: 12353257

Magnetic resonance histology for morphologic phenotyping.

Johnson G Allan; Cofer Gary P; Fubara Boma; Gewalt Sally L; Hedlund Laurence W; Maronpot Robert R

Center for In Vivo Microscopy, Duke University Medical Center, Durham, North Carolina 27710, USA. gaj@orion.mc.duke.edu

Journal of magnetic resonance imaging - JMRI (United States) Oct 2002,

16 (4) p423-9, ISSN 1053-1807 Journal Code: 9105850

Contract/Grant No.: P41RR05959; RR; NCRR; R24CA92656; CA; NCI

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: Completed

Subfile: INDEX MEDICUS

Magnetic resonance histology (MRH) images of the whole mouse have been acquired at 100-micron isotropic resolution at 2.0 T with image arrays of 256 x 256 x 1024. Higher resolution

(50 x 50 x 50 microns) of limited volumes has been acquired at 7.1T with image arrays of 512 x 512 x 512. Even higher resolution images (20 x 20 x 20 microns) of isolated organs have been acquired at 9.4 T. The volume resolution represents an increase of 625000 x over conventional clinical MRI. The technological basis is summarized that will allow basic scientists to begin using MRH as a routine method for morphologic phenotyping of the mouse. MRH promises four unique attributes over conventional histology: 1). MRH is non-destructive; 2). MRH exploits the unique contrast mechanisms that have made MRI so successful clinically; 3). MRH is 3-dimensional; and 4). the data are inherently digital. We demonstrate the utility in morphologic phenotyping a whole C57BL/6J mouse. Copyright 2002 Wiley-Liss, Inc.

Tags: Support, U.S. Gov't, P.H.S.

Descriptors: Magnetic Resonance Imaging; Animals; Magnetic Resonance Imaging--methods--MT; Mice; Mice, Inbred C57BL; Phenotype

Record Date Created: 20020927

Record Date Completed: 20021203

28/9/7 (Item 7 from file: 155)

DIALOG(R) File 155:MEDLINE(R)

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09266125 PMID: 1565694

Analytical study of performance in a 3D PET scanner.

Lecomte R

Department of Nuclear Medicine and Radiobiology, Faculty of Medicine, Universite de Sherbrooke, Quebec, Canada.

Physics in medicine and biology (ENGLAND) Mar 1992, 37 (3) p623-34, ISSN 0031-9155 Journal Code: 0401220

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: Completed

Subfile: INDEX MEDICUS

The use of arrays of small discrete detectors and thin slices to achieve a high isotropic spatial resolution in positron emission tomography (PET) results in systems with a low ring sensitivity. In a multi-ring system, the overall sensitivity can be considerably improved by removing the interslice collimators to make full use of all cross slices coincidences, but this is achieved at the expense of increased scatter and accidental rates in the image. For imaging of small laboratory animals (diameter of 10 cm or less), the relieved burden of scatters, and to some extent accidentals, suggests that volumetric imaging may be of particular value. In order to evaluate the performance to be expected from a small animal PET scanner (10 cm diameter field) with and without the interplane

*Date Noted
TAF 5/12/2004*

collimators, the incident event rates for singles (unscattered and single scattered) and true, scatter and accidental coincidences were evaluated analytically. The performance was evaluated for various source sizes and activities in terms of five criteria: true/single ratio, scatter fraction, accidental fraction, image contrast and noise effective sensitivity. As a result of a 3-fold increase in scatter fraction and of a significant increase in accidental fraction for larger sources, the image contrast ($\text{true}/(\text{scatter}+\text{accidental})$) is observed to always be inferior with the collimators removed. However, a significant improvement in noise effective sensitivity is obtained with the volumetric configuration, especially for small size sources placed at the centre of the field of view. It is concluded that the volumetric configuration is more advantageous than the multislice configuration to image small animals because the gain in sensitivity overcomes the loss of accuracy due to higher scatter and accidental rates.

Tags: Support, Non-U.S. Gov't

Descriptors: *Tomography, Emission-Computed--instrumentation--IS; Animals; Animals, Laboratory; Sensitivity and Specificity

Record Date Created: 19920521

Record Date Completed: 19920521

28/9/8 (Item 1 from file: 2)

DIALOG(R)File 2:INSPEC

(c) 2004 Institution of Electrical Engineers. All rts. reserv.

7548976 INSPEC Abstract Number: A2003-08-4725-001

Title: On the physical mechanisms of two-way coupling in particle-laden isotropic turbulence

Author(s): Ferrante, A.; Elghobashi, S.

Author Affiliation: Dept. of Mech. & Aerosp. Eng., Univ. of California, Irvine, CA, USA

Journal: Physics of Fluids vol.15, no.2 p.315-29

Publisher: AIP,

Publication Date: Feb. 2003 Country of Publication: USA

CODEN: PHFLE6 ISSN: 1070-6631

SICI: 1070-6631(200302)15:2L:315:PMCP;1-X

Material Identity Number: B479-2003-001

U.S. Copyright Clearance Center Code: 1070-6631/2003/15(2)/315(15)/\$19.00

Language: English Document Type: Journal Paper (JP)

Treatment: Theoretical (T)

Abstract: The objective of the present study is to analyze our recent direct numerical simulation (DNS) results to explain in some detail the main physical mechanisms responsible for the modification of isotropic turbulence by dispersed solid particles. The details of these two-way coupling mechanisms have not been explained in earlier publications. The present study, in comparison to the previous DNS studies, has been performed with higher resolution ($Re/\text{sub } \lambda = 75$) and considerably larger number (80 million) of particles, in addition to accounting for the effects of gravity. We study the modulation of turbulence by the dispersed particles while fixing both their volume fraction, $\phi/\text{sub } v = 10/\text{sup } -3/$, and mass fraction, $\phi/\text{sub } m = 1$, for three different particles classified by the ratio of their response time to the Kolmogorov time scale: microparticles, $\tau/\text{sub } p // \tau/\text{sub } k < 1$, critical particles, $\tau/\text{sub } p // \tau/\text{sub } k \approx 1$, large particles, $\tau/\text{sub } p // \tau/\text{sub } k > 1$. Furthermore, we show that in zero gravity, dispersed particles with $\tau/\text{sub } p // \tau/\text{sub } k = 0.25$ (denoted here as "ghost particles") modify the spectra of the turbulence kinetic energy and its dissipation rate in such a way that keeps the decay rate of the turbulence energy nearly identical to that of particle-free turbulence, and thus the two-way coupling effects of these ghost particles would not be detected by examining only the temporal behavior of the turbulence energy of the carrier flow either numerically or experimentally. In finite gravity, these ghost particles accumulate, via the mechanism of preferential sweeping resulting in the stretching of the vortical structures in the gravitational direction, and the creation of local gradients of the drag force which increase the magnitudes of the horizontal

components of vorticity. Consequently, the turbulence becomes anisotropic with a reduced decay rate of turbulence kinetic energy as compared to the particle-free case. (15 Refs)

Subfile: A

Descriptors: flow simulation; modulation; turbulence; two-phase flow; vortices; zero gravity experiments

Identifiers: physical mechanisms; two-way coupling; particle-laden isotropic turbulence; direct numerical simulation; isotropic turbulence; dispersed solid particles; two-way coupling mechanisms; gravity; turbulence modulation; dispersed particles; volume fraction; mass fraction; Kolmogorov time scale; microparticles; zero gravity; ghost particles; turbulence kinetic energy spectra; two-way coupling effects; turbulence energy; temporal behavior; carrier flow; preferential sweeping mechanism; vortical structures; local gradients; drag force; horizontal components; vorticity; anisotropic turbulence; reduced decay rate; three-dimensional energy spectra; decaying isotropic turbulence; critical particles; turbulence kinetic energy; two-way interaction

Class Codes: A4725 (Turbulent flows, convection, and heat transfer); A4755K (Multiphase flows); A4730 (Rotational flow, vortices, buoyancy and other flows involving body forces); A4710 (General fluid dynamics theory, simulation and other computational methods)

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NA
TAF 5/12/2004

28/9/9 (Item 2 from file: 2)

DIALOG(R)File 2:INSPEC

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7005258 INSPEC Abstract Number: A2001-18-8760I-008, B2001-09-7510N-083, C2001-09-7330-311

Title: High resolution contrast-enhanced magnetic resonance angiography of carotid arteries using an array coil on a cardiovascular scanner

Author(s): Liu, Y.; Breger, R.; Foo, T.; Hollrich, T.; Yanny, L.; Blechinger, J.; Liu, Y.

Conference Title: Proceedings of the 22nd Annual International Conference of the IEEE Engineering in Medicine and Biology Society (Cat. No.00CH37143) Part vol.4 p.2864-5 vol.4

Editor(s): Enderle, J.D.

Publisher: IEEE, Piscataway, NJ, USA

Publication Date: 2000 Country of Publication: USA 4 vol. xxiii+3272 pp.

ISBN: 0 7803 6465 1 Material Identity Number: XX-2001-00103

U.S. Copyright Clearance Center Code: 0 7803 6465 1/2000/\$10.00

Conference Title: Proceedings of the 22nd Annual International Conference of the IEEE Engineering in Medicine and Biology Society

Conference Date: 23-28 July 2000 Conference Location: Chicago, IL, USA

Language: English Document Type: Conference Paper (PA)

Treatment: Experimental (X)

Abstract: 3D contrast-enhanced MR angiography (CE-MRA) of the carotid arteries is technically challenging despite its increasing clinical use. Spatial resolution remains to be limited by the contrast agent bolus concentration's transient nature, rapid venous enhancement, and voxel size of the acquisition matrix. In order for carotid CE-MRA to be considered an adequate alternative or replacement to X-ray angiography, it is our perspective that isotropic high resolution carotid CE-MRA is crucial which can reveal details of pathology in reformat and maximum-intensity-projection post processing. Also in carotid CE-MRA an accurate timing for image acquisition is essential. This has been addressed with real-time fluoroscopic triggering, smart-prep time-resolved acquisition, and test bolus techniques. The purpose of this study is to use smart-prep CE-MRA technique with a combined head-neck-cervical spine neurovascular array coil on a dedicated 1.5 T cardiovascular scanner, to acquire isotropic high resolution CE-MRA from the aortic arch through circle of Willis within a single bolus contrast acquisition in a routine clinical

Do No Good
TAF 5/12/2004

setting. (5 Refs)

Subfile: A B C

Descriptors: angiocardiology; biomedical equipment; biomedical MRI; blood vessels; cardiovascular system; image registration; image resolution; medical image processing

Identifiers: carotid arteries; 3D contrast-enhanced MRI angiography; cardiovascular scanner; array coil; high resolution; spatial resolution; contrast agent bolus concentration; maximum-intensity-projection post processing; accurate timing; image acquisition; real-time fluoroscopic triggering; smart-prep time-resolved acquisition; head-neck-cervical spine neurovascular; aortic arch; circle of Willis; single bolus contrast acquisition; 1.5 T

Class Codes: A8760I (Medical magnetic resonance imaging and spectroscopy); A8740 (Biomagnetism); A8770E (Patient diagnostic methods and instrumentation); A8745H (Haemodynamics, pneumodynamics); B7510N (Biomedical magnetic resonance imaging and spectroscopy); B6135 (Optical, image and video signal processing); C7330 (Biology and medical computing); C5260B (Computer vision and image processing techniques)

Numerical Indexing: magnetic flux density 1.5E+00 T

Copyright 2001, IEE

28/9/10 (Item 3 from file: 2)

DIALOG(R)File 2:INSPEC

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5970986 INSPEC Abstract Number: A9816-8760K-057, B9808-7510B-325

Title: High-resolution 3D Bayesian image reconstruction using the microPET small-animal scanner

Author(s): Jinyi Qi; Leahy, R.M.; Cherry, S.R.; Chatzioannou, A.; Farquhar, T.H.

Author Affiliation: Signal & Image Process. Inst., Univ. of Southern California, Los Angeles, CA, USA

Journal: Physics in Medicine and Biology Conference Title: Phys. Med. Biol. (UK) vol.43, no.4 p.1001-13

Publisher: IOP Publishing,

Publication Date: April 1998 Country of Publication: UK

CODEN: PHMBA7 ISSN: 0031-9155

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U.S. Copyright Clearance Center Code: 0031-9155/98/041001+13\$19.50

Conference Title: Fourth International Meeting on Fully Three-Dimensional Image Reconstruction in Radiology and Nuclear Medicine (3D97)

Conference Date: 25-28 June 1997 Conference Location: Pittsburgh, PA, USA

Document Number: S0031-9155(98)90627-3

Language: English Document Type: Conference Paper (PA); Journal Paper (JP)

Treatment: Theoretical (T)

Abstract: A Bayesian method is described for reconstruction of high-resolution 3D images from the microPET small-animal scanner. Resolution recovery is achieved by explicitly modelling the depth dependent geometric sensitivity for each voxel in combination with an accurate detector response model that includes factors due to photon pair non-collinearity and inter-crystal scatter and penetration. To reduce storage and computational costs we use a factored matrix in which the detector response is modelled using a sinogram blurring kernel. Maximum a posteriori (MAP) images are reconstructed using this model in combination with a Poisson likelihood function and a Gibbs prior on the image. Reconstructions obtained from point source data using the accurate system model demonstrate a potential for near-isotropic FWHM resolution of approximately 1.2 mm at the center of the field of view compared with approximately 2 mm when using an analytic 3D reprojection (3DRP) method with a ramp filter. These results also show the ability of the accurate system model to compensate for resolution loss due to crystal penetration producing nearly constant radial FWHM resolution of

1 mm out to a 4 mm radius. Studies with a point source in a uniform cylinder indicate that as the resolution of the image is reduced to control noise propagation the resolution obtained using the accurate system model is superior to that obtained using 3DRP at matched background noise levels. Additional studies using pie phantoms with hot and cold cylinders of diameter 1-2.5 mm and /sup 18/FDG animal studies appear to confirm this observation. (21 Refs)

Subfile: A B

Descriptors: Bayes methods; image reconstruction; medical image processing; positron emission tomography

Identifiers: high-resolution three dimensional

Bayesian image reconstruction; micro positron emission tomography small-animal scanner; Bayesian method; resolution recovery; depth dependent geometric sensitivity; voxel; accurate detector response model; photon pair noncollinearity; inter-crystal scatter; inter-crystal penetration; sinogram blurring kernel; maximum a posteriori images; Poisson likelihood function; Gibbs prior; point source data; accurate system model; near-isotropic full width half maximum resolution; field of view; analytic three dimensional reprojection method; ramp filter; resolution loss; uniform cylinder; noise propagation; matched background noise levels; pie phantoms; cold cylinders; hot cylinders

Class Codes: A8760K (Nuclear medicine, emission tomography); A8770E (Patient diagnostic methods and instrumentation); B7510B (Radiation and radioactivity applications in biomedicine); B6140C (Optical information, image and video signal processing); B0240 (Probability and statistics)

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28/9/11 (Item 4 from file: 2)

DIALOG(R)File 2:INSPEC

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5956644 INSPEC Abstract Number: A9815-8760K-035, B9808-7510B-175

Title: Performance evaluation of a whole-body PET scanner using the NEMA protocol

Author(s): Brix, G.; Zaers, J.; Adam, L.-E.; Bellemann, M.E.; Ostertag, H.; Trojan, H.; Haberkorn, U.; Doll, J.; Oberdorfer, F.; Lorenz, W.J.

Author Affiliation: Res. Program Radiol. Diagnostics & Therapy, Cancer Res. Center, Heidelberg, Germany

Journal: Journal of Nuclear Medicine vol.38, no.10 p.1614-23

Publisher: Soc. Nucl. Med,

Publication Date: Oct. 1997 Country of Publication: USA

CODEN: JNMEAQ ISSN: 0161-5505

SICI: 0161-5505(199710)38:10L:1614:PEWB;1-O

Material Identity Number: J121-98007

Language: English Document Type: Journal Paper (JP)

Treatment: Practical (P)

Abstract: This study evaluates the performance of the newly developed high-resolution whole-body PET scanner ECAT EXACT HR/sup +/- . The scanner consists of four rings of 72 bismuth germanate block detectors each, covering an axial field of view of 15.5 cm with a patient port of 56.2 cm. A single block detector is divided into an 8*8 matrix, giving a total of 32 rings with 576 detectors each. The dimensions of a single detector element are 4.39*4.05*30 mm/sup 3/. The scanner is equipped with extendable tungsten septa for two-dimensional (2D) measurements, as well as with three /sup 68/Ge line sources for transmission scans and daily quality control. The spatial resolution, scatter fraction, count rate, sensitivity, uniformity and accuracy of the implemented correction algorithms were evaluated after the National Electrical Manufacturers Association protocol using the standard acquisition parameters. The transaxial resolution in the 2D mode is 4.3 mm (4.4 mm) in the center and increases to 4.7 mm (4.8 mm) tangential and to 8.3 mm (8.0 mm) radial at a distance of r=20 cm from the center. The axial slice width measured in the 2D mode varies between 4.2 and 6.6 mm FWHM over the transaxial field of view. In the three-dimensional (3D) mode the average axial resolution varies between 4.1 mm FWHM in the center and 7.8 mm at r=20 cm. The scatter

fraction is 17.1% (32.5%) for a lower energy discriminator level of 350 keV. The maximum true event count rate of 263 (345) kcps was measured at an activity concentration of 142 (26.9) kBq/ml. The total system sensitivity for true events is 5.7 (27.7) cps/Bq/ml. From the uniformity measurements, the authors obtained a volume variance of 3.9% (5.0%) and a system variance of 1.6% (1.7%). The implemented 3D scatter correction algorithm reveals very favorable properties, whereas the 3D attenuation correction yields slightly inaccurate results in low-and high-density regions. The ECAT EXACT HR/sup +/- has an excellent, nearly isotropic spatial resolution, which is advantageous for brain and small animal studies. While the relatively low slice sensitivity may hamper the capability for performing fast dynamic 2D studies, the scanner offers a sufficient sensitivity and count rate capacity for fully 3D whole-body imaging. (17 Refs)

Subfile: A B

Descriptors: biomedical equipment; equipment evaluation; image resolution; positron emission tomography; quality control

Identifiers: sup 68/Ge line sources; medical instrument performance evaluation; NEMA protocol; high-resolution whole-body PET scanner; ECAT EXACT HR/sup +/-; transmission scans; daily quality control; transaxial resolution; two-dimensional mode; diagnostic nuclear medicine; three-dimensional mode; axial resolution; scatter fraction; maximum true event count rate; total system sensitivity; volume variance; uniformity measurements; brain; small animal studies; 15.5 cm; 56.2 cm; 20 cm; 350 keV; Ge

Class Codes: A8760K (Nuclear medicine, emission tomography); A8770E (Patient diagnostic methods and instrumentation); B7510B (Radiation and radioactivity applications in biomedicine); B0170L (Inspection and quality control)

Chemical Indexing:

Ge el (Elements - 1)

Numerical Indexing: size 1.55E-01 m; size 5.62E-01 m; distance 2.0E-01 m; electron volt energy 3.5E+05 eV

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28/9/12 (Item 5 from file: 2)

DIALOG(R)File 2:INSPEC

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5632986 INSPEC Abstract Number: A9716-8760K-018, B9708-7510B-220

Title: MicroPET: a high resolution PET scanner for imaging small animals

Author(s): Cherry, S.R.; Shao, Y.; Silverman, R.W.; Meadors, K.; Siegel, S.; Chatziioannou, A.; Young, J.W.; Jones, W.; Moyers, J.C.; Newport, D.; Bouteffnouchet, A.; Farquhar, T.H.; Andreaco, M.; Paulus, M.J.; Binkley, D.M.; Nutt, R.; Phelps, M.E.

Author Affiliation: Dept. of Molecular & Med. Pharmacology, California Univ., Los Angeles, CA, USA

Journal: IEEE Transactions on Nuclear Science Conference Title: IEEE Trans. Nucl. Sci. (USA) vol.44, no.3, pt.2 p.1161-6

Publisher: IEEE,

Publication Date: June 1997 Country of Publication: USA

CODEN: IETNAE ISSN: 0018-9499

SICI: 0018-9499(199706)44:3:2L:1161:MHRS;1-B

Material Identity Number: I047-97006

U.S. Copyright Clearance Center Code: 0018-9499/97/\$10.00

Conference Title: 1996 Nuclear Science Symposium and Medical Imaging Conference (NSS/MIC)

Conference Date: 3-9 Nov. 1996 Conference Location: Anaheim, CA, USA

Language: English Document Type: Conference Paper (PA); Journal Paper (JP)

Treatment: Practical (P); Experimental (X)

Abstract: MicroPET is a high resolution positron emission tomography (PET) scanner designed for imaging small laboratory animals. It consists of a ring of 30 position-sensitive scintillation detectors, each with an 8*8 array of small lutetium oxyorthosilicate

(LSO) crystals coupled via optical fibers to a multi-channel photomultiplier tube. The detectors have an intrinsic resolution averaging 1.68 mm, an energy resolution between 15 and 25% and 2.4 ns timing resolution at 511 keV. The detector ring diameter of microPET is 17.2 cm with an imaging field of view of 112 mm transaxially by 18 mm axially. The scanner has no septa and operates exclusively in 3D mode. Reconstructed image resolution 1 cm from the center of the scanner is 2.0 mm and virtually isotropic, yielding a volume resolution of 8 mm/sup 3/. For comparison, the volume resolution of state-of-the-art clinical PET systems is in the range of 50-75 mm/sup 3/. Initial images of phantoms have been acquired and are reported. A computer controlled bed is under construction and will incorporate a small wobble motion to improve spatial sampling. This is projected to further enhance spatial resolution. MicroPET is the first PET scanner to incorporate the new scintillator LSO and to our knowledge is the highest resolution multi-ring PET scanner currently in existence. (26

Refs)

Subfile: A B

Descriptors: biological techniques; biomedical equipment; image reconstruction; image resolution; medical image processing; photomultipliers; positron emission tomography; solid scintillation detectors

Identifiers: microPET; high resolution PET scanner; small animal imaging; positron emission tomography; small laboratory animals; position-sensitive scintillation detector ring; 8*8 array; 8 by 8 array; lutetium oxyorthosilicate crystals; optical fibers; multi-channel photomultiplier tube; intrinsic resolution; energy resolution; timing resolution; 3D mode; reconstructed image resolution; volume resolution; phantoms; computer controlled bed; small wobble motion; spatial sampling; spatial resolution; scintillator; highest resolution multi-ring PET scanner; 511 keV; LuOSiO/sub 4

Class Codes: A8760K (Nuclear medicine, emission tomography); A8770E (Patient diagnostic methods and instrumentation); A8780 (Biophysical instrumentation and techniques); A2940M (Scintillation detectors; scintillators and photomultipliers); B7510B (Radiation and radioactivity applications in biomedicine); B7420 (Particle and radiation detection and measurement); B6140C (Optical information, image and video signal processing)

Chemical Indexing:

LuOSiO₄ ss - SiO₄ ss - Lu ss - O₄ ss - Si ss - O ss (Elements - 3)

Numerical Indexing: electron volt energy 5.11E+05 eV

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28/9/13 (Item 6 from file: 2)

DIALOG(R)File 2:INSPEC

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03741364 INSPEC Abstract Number: A90138697

Title: Three-dimensional imaging system based on Fourier transform synthetic aperture focusing technique

Author(s): Mayer, K.; Marklein, R.; Langenberg, K.J.; Kreutter, T.

Author Affiliation: Dept. of Electr. Eng., Kassel Univ., West Germany

Journal: Ultrasonics vol.28, no.4 p.241-55

Publication Date: July 1990 Country of Publication: UK

CODEN: ULTRA3 ISSN: 0041-624X

Language: English Document Type: Journal Paper (JP)

Treatment: Practical (P); Theoretical (T)

Abstract: For planar scan surfaces, digitized ultrasonic RF-data can be adequately processed in terms of the Fourier transform synthetic aperture focusing technique algorithm, i.e. in terms of synthetic aperture pulse-echo backpropagation utilizing Fourier transforms only, to yield a quantitative three-dimensional image of defects residing in the homogeneous and isotropic bulk material. The implementation of this algorithm into an ultrasonic imaging system is described, which mainly comprises an array processor and high-resolution graphics to display the three-dimensional reconstruction volume as a

walk-through along three orthogonal planes. To enhance the signal-to-noise ratio and the axial resolution of the system, controlled ultrasonic signals are transmitted as complementary Golay-sequences, cross-correlated with the received signals and deconvolved with similarly obtained reference signals. (25 Refs)

Subfile: A

Descriptors: acoustic imaging; acoustic signal processing; Fourier transforms; ultrasonic materials testing

Identifiers: Fourier transform synthetic aperture focusing technique; planar scan surfaces; digitized ultrasonic RF-data; pulse-echo backpropagation; three-dimensional image; defects; ultrasonic imaging system; array processor; high-resolution graphics; signal-to-noise ratio; axial resolution; complementary Golay-sequences

Class Codes: A4335 (Ultrasonics, quantum acoustics, and physical effects of sound); A4360 (Acoustic signal processing); A4385 (Acoustical measurements and instrumentation); A0230 (Function theory, analysis); A8170C (Nondestructive testing)

28/9/14 (Item 1 from file: 5)

DIALOG(R) File 5: Biosis Previews(R)

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0013372897 BIOSIS NO.: 200100544736

Stochastic tomography, regional volumetric comparisons, and genotype-anatomical correlation in patients with spinocerebellar ataxia type 6 and episodic ataxia type 2

AUTHOR: Ying S H (Reprint); Alger J R; Rex D E (Reprint); Pitiot A (Reprint); Jen J C (Reprint); Baloh R W (Reprint); Iacoboni M (Reprint); Mazziotta J C (Reprint); Toga A W (Reprint)

AUTHOR ADDRESS: Neurology, UCLA SOM, Los Angeles, CA, USA**USA

JOURNAL: Society for Neuroscience Abstracts 27 (1): p1508 2001 2001

MEDIUM: print

CONFERENCE/MEETING: 31st Annual Meeting of the Society for Neuroscience San Diego, California, USA November 10-15, 2001; 20011110

ISSN: 0190-5295

DOCUMENT TYPE: Meeting; Meeting Abstract

RECORD TYPE: Abstract

LANGUAGE: English

ABSTRACT: Our goal was to study differences in brain morphology using high-resolution magnetic resonance imaging in patients with spinocerebellar ataxia type 6 (SCA6) and episodic ataxia type 2 (EA2). SCA6 and EA2 are allelic diseases involving mutations of the CACNA1A gene on chromosome 19p. CACNA1A encodes for Ca(V)2.1, the pore-forming alpha-1-A subunit of the human neuronal P/Q-type voltage-dependent calcium channel, which is widely expressed in the central nervous system. The overlapping clinical manifestations include abnormalities referable to the midline cerebellum, including dysarthria, gait ataxia, gaze-evoked and downbeat nystagmus, and disruption of the visual pursuit system and visual-vestibular interaction. Ten patients were compared to age- and gender-matched controls, as well as to unaffected family members when possible. An average of six T1-weighted MR images with 0.59 to 1.05 mm3 isotropic voxels were obtained on a 3T GE scanner. The orientation of each acquisition underwent slight stochastic variation. Automatic registration and three-dimensional signal interpolation produced higher resolution tomographic images with a voxel size of 0.47 mm3. Through semi-automated segmentation and tissue classification, we were able to obtain volumetric data that were both precise and reliable for all regions except the inferior temporal lobe. Comparison of morphometric and volumetric phenotype revealed significant differences in affected individuals versus normal controls, particularly in the cerebellar vermis and hemispheres.

DESCRIPTORS:

MAJOR CONCEPTS: Medical Genetics--Allied Medical Sciences; Molecular Genetics--Biochemistry and Molecular Biophysics; Neurology--Human Medicine, Medical Sciences; Radiology--Medical Sciences

BIOSYSTEMATIC NAMES: Hominidae--Primates, Mammalia, Vertebrata, Chordata, Animalia

ORGANISMS: human (Hominidae)--patient
 ORGANISMS: PARTS ETC: brain--nervous system, morphology; central nervous system--nervous system; cerebellar hemisphere--nervous system; cerebellar vermis--nervous system; chromosome 19--short arm; inferior temporal lobe--nervous system; midline cerebellum--nervous system
 COMMON TAXONOMIC TERMS: Animals; Chordates; Humans; Mammals; Primates; Vertebrates
 DISEASES: episodic ataxia type 2--nervous system disease, clinical manifestations; spinocerebellar ataxia type 6--nervous system disease, clinical manifestations
 MESH TERMS: Spinocerebellar Degenerations (MeSH)
 CHEMICALS & BIOCHEMICALS: CACNA1A; calcium channel--expression
 GENE NAME: human CACNA1A gene (Hominidae)--mutation
 METHODS & EQUIPMENT: genotype-anatomical correlation method--assessment method; regional volumetric comparison method--assessment method; stochastic tomography--imaging method
 MISCELLANEOUS TERMS: Meeting Abstract; Meeting Abstract
 CONCEPT CODES:
 00520 General biology - Symposia, transactions and proceedings
 03502 Genetics - General
 03508 Genetics - Human
 06504 Radiation biology - Radiation and isotope techniques
 10508 Biophysics - Membrane phenomena
 11102 Anatomy and Histology - Gross anatomy
 20504 Nervous system - Physiology and biochemistry
 20506 Nervous system - Pathology
 BIOSYSTEMATIC CODES:
 86215 Hominidae

28/9/15 (Item 1 from file: 8)
 DIALOG(R)File 8:Ei Compendex(R)
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06194088 E.I. No: EIP02457194344
 Title: Computer aided lung nodule detection on high resolution CT data
 Author: Wiemker, Rafael; Rogalla, Patrik; Zwartkruis, Andre; Blaffert, Thomas
 Corporate Source: Philips Research Laboratories, Hamburg, Germany
 Conference Title: Medical Imaging 2002: Image Processing
 Conference Location: San Diego, CA, United States Conference Date: 20020224-20020228
 Sponsor: SPIE
 E.I. Conference Number: 60174
 Source: Proceedings of SPIE - The International Society for Optical Engineering v 4684 II 2002. p 677-688
 Publication Year: 2002
 CODEN: PSISDG ISSN: 0277-786X
 Language: English
 Document Type: CA; (Conference Article) Treatment: T; (Theoretical); X; (Experimental)
 Journal Announcement: 0211W3

Abstract: Most of the previous approaches to computer aided lung nodule detection have been designed for and tested on conventional CT with slice thickness of 5-10 mm. In this paper, we report results of a specifically designed detection algorithm which is applied to 1 mm slice data from multi-array CT. We see two principal advantages of high resolution CT data with respect to computer aided lung nodule detection: First of all, the algorithm can evaluate the fully isotropic three dimensional shape information of potential nodules and thus resolve ambiguities between pulmonary nodules and vessels. Secondly, the use of 1 mm slices allows the direct utilization of the Hounsfield values due to the absence of the partial volume effect (for objects larger than 1 mm). Computer aided detection of small lung nodules (greater than or equivalent 2mm) may thus experience a break-through in clinical relevance with the use of

high resolution CT. The detection algorithm has been applied to image data sets from patients in clinical routine with a slice thickness of 1 mm and reconstruction intervals between 0.5 and 1 mm, with hard- and soft-tissue reconstruction filters. Each thorax data set comprises 300-500 images. More than 20000 CT slices from 50 CT studies were analyzed by the computer program, and 12 studies have so far been reviewed by an experienced radiologist. Of 203 nodules with diameter greater than or equivalent 2 mm (including pleura-attached nodules), the detection algorithm found 193 (sensitivity of 95%), with 4.4 false positives per patient. Nodules attached to the lung wall are algorithmically harder to detect, but we observe the same high detection rate. The false positive rate drops below 1 per study for nodules greater than or equivalent 4 mm. 24 Refs.

Descriptors: *Medical imaging; Computerized tomography; Data reduction; Computer aided diagnosis; Pulmonary diseases; Image analysis; Image reconstruction; Radiology; Image segmentation; Computer programming; Algorithms

Identifiers: Lung cancer screening

Classification Codes:

461.1 (Biomedical Engineering); 723.5 (Computer Applications); 723.2 (Data Processing); 461.6 (Medicine); 723.1 (Computer Programming)

461 (Bioengineering); 723 (Computer Software, Data Handling & Applications)

46 (BIOENGINEERING); 72 (COMPUTERS & DATA PROCESSING)

28/9/16 (Item 1 from file: 73)

DIALOG(R)File 73:EMBASE

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07809119 EMBASE No: 1999298587

Comparison of three-dimensional visualization techniques for depicting the scala vestibuli and scala tympani of the cochlea by using high-resolution MR imaging

Hans P.; Grant A.J.; Laitt R.D.; Ramsden R.T.; Kassner A.; Jackson A. Prof. A. Jackson, Department of Diagnostic Radiology, Stopford Medical School, Oxford Rd, Manchester M13 9PT United Kingdom American Journal of Neuroradiology (AM. J. NEURORADIOL.) (United States) 1999, 20/7 (1197-1206)

CODEN: AAJND ISSN: 0195-6108

DOCUMENT TYPE: Journal; Article

LANGUAGE: ENGLISH SUMMARY LANGUAGE: ENGLISH

NUMBER OF REFERENCES: 27

BACKGROUND AND PURPOSE: Cochlear implantation requires introduction of a stimulating electrode array into the scala vestibuli or scala tympani. Although these structures can be separately identified on many high-resolution scans, it is often difficult to ascertain whether these channels are patent throughout their length. The aim of this study was to determine whether an optimized combination of an imaging protocol and a visualization technique allows routine 3D rendering of the scala vestibuli and scala tympani. METHODS: A submillimeter T2 fast spin-echo imaging sequence was designed to optimize the performance of 3D visualization methods. The spatial resolution was determined experimentally using primary images and 3D surface and volume renderings from eight healthy subjects. These data were used to develop the imaging sequence and to compare the quality and signal-to-noise dependency of four data visualization algorithms: maximum intensity projection, ray casting with transparent voxels, ray casting with opaque voxels, and isosurface rendering. The ability of these methods to produce 3D renderings of the scala tympani and scala vestibuli was also examined. The imaging technique was used in five patients with sensorineural deafness. RESULTS: Visualization techniques produced optimal results in combination with an isotropic volume imaging sequence. Clinicians preferred the isosurface-rendered images to other 3D visualizations. Both isosurface and ray casting displayed the scala vestibuli and scala tympani throughout their length. Abnormalities were

shown in three patients, and in one of these, a focal occlusion of the scala tympani was confirmed at surgery. CONCLUSION: Three-dimensional images of the scala vestibuli and scala tympani can be routinely produced. The combination of an MR sequence optimized for use with isosurface rendering or ray-casting algorithms can produce 3D images with greater spatial resolution and anatomic detail than has been possible previously.

DEVICE BRAND NAME/MANUFACTURER NAME: 1.5T Philips Medical Systems ACS NT scanner/Philips

DEVICE MANUFACTURER NAMES: Philips

MEDICAL DESCRIPTORS:

*nuclear magnetic resonance imaging; *cochlea injury--diagnosis--di
surgical anatomy; three dimensional imaging; signal noise ratio
; electron spin resonance; image analysis; image quality; algorithm; human;
male; female; human experiment; normal human; human tissue; human cell;
adult; article

SECTION HEADINGS:

008 Neurology and Neurosurgery

014 Radiology

027 Biophysics, Bioengineering and Medical Instrumentation

28/9/17 (Item 1 from file: 987)

DIALOG(R)File 987:TULSA (Petroleum Abs)

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01034284 PETROLEUM ABSTRACTS NO.: 773072

ENHANCED ANISOTROPY FROM JOINT PROCESSING OF MULTICOMPONENT AND MULTI-
ARRAY INDUCTION TOOLS

RABINOVICH M; TAVAROVSKY L

BAKER ATLAS

42ND ANNU SPWLA LOGGING SYMP (HOUSTON, TX, 6/17-20/2001) TRANS PAP NO HH,
2001 (10 PP; 4 REFS)

2001

LANGUAGE: ENGLISH

DOCUMENT TYPE: MEETING PAPER TEXT; AT

A new well-site processing technique is developed for interpreting multicomponent induction logging data. Incorporation of array induction data in this processing improves the speed, vertical resolution, and reliability of results. The 3D Explorer (3DEX(TM)) instrument acquires multicomponent and multifrequency induction measurements that are sensitive to formation anisotropy. The response of the tool is highly nonlinear with respect to anisotropy parameters. It is influenced by borehole wash-outs, tool eccentricity, and mud filtrate invasion. Typically, the data can be interpreted using complicated and time-consuming inversion techniques. A multifrequency focusing (MFF) method is proposed to provide fast and stable anisotropy processing based on a multifrequency skin-effect correction of the transverse induction data and a subsequent special transformation of the corrected data called the k3-transform. The k3-transform is not sensitive to environmental effects caused by the borehole and near-borehole structures. The coefficient of anisotropy is extracted based on its analytical relationship with k3-transformed data for horizontal and vertical coils. The accuracy and reliability of the MFF processing depends on the accuracy of recovered horizontal resistivities. The 3DEX interpretation is enhanced by introducing accurate horizontal resistivities with high vertical resolution from conventional array induction tool

PRIMARY DESCRIPTOR: INDUCTION LOGGING

MAJOR DESCRIPTORS: ANISOTROPY; DATA; ELECTRIC LOGGING; FOCUSED CURRENT LOGGING; FOCUSING; INTERPRETATION; ISOTROPY; MULTICOMPONENT DATA; MULTICOMPONENT RECORDING; RECORDING; RESISTIVITY LOGGING; WAVE FOCUSING; WELL LOG INTERPRETATION; WELL LOGGING

MINOR DESCRIPTORS: ARRAY; ATLANTIC OCEAN; BOREHOLE; CHART; COEFFICIENT; COMPUTING TIME; DATA PROCESSING; DETECTOR LOCATION; DETECTOR RESPONSE; DIPOLE; ECCENTRIC; ELECTRIC FIELD; ELECTRICAL CONDUCTIVITY; ELECTRICAL EQUIPMENT; ELECTRICAL MODEL; ELECTRICAL PROPERTY; ELECTRICITY;

ELECTROMAGNETIC FIELD; ELECTROMAGNETIC WAVE; ELECTROMAGNETIC WAVE SRCE;
ELECTROMAGNETISM; ELECTRONIC EQUIPMENT; FILTRATE; FORMATION DAMAGE;
FREQUENCY; GRAPH; HOLE ENLARGEMENT; HORIZONTAL; INDUCTANCE COIL; INVADIED
ZONE; MAGNETIC FIELD; MAGNETISM; MATHEMATICAL ANALYSIS; MATHEMATICAL MODEL;
MATHEMATICS; MEXICO GULF; MODEL; MUD FILTRATE; MULTIPLE; NONLINEAR;
NUMERICAL INVERSION; PATTERN; PHYSICAL PROPERTY; POSITIONING (WELL);
RECEIVER (ELECTRONIC); RESISTIVITY; RESISTIVITY CURVE; RESISTIVITY MODEL;
RESPONSE; SEAS AND OCEANS; SKIN EFFECT (ELECTRICITY); SKIN EFFECT (WELL);
TIME; TRANSMITTER; TRUE RESISTIVITY; VERTICAL; WAVE; WAVE SOURCE; WELL
LOGGING DATA; WELL LOGGING EQUIPMENT

SUBJECT HEADING: WELL LOGGING & SURVEYING

28/9/18 (Item 2 from file: 987)
DIALOG(R) File 987:TULSA (Petroleum Abs)
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01000457 PETROLEUM ABSTRACTS NO.: 739245

STATISTICAL CHARACTERIZATION OF THE THREE- DIMENSIONAL
MICROGEOMETRY OF POROUS MEDIA AND CORRELATION WITH MACROSCOPIC TRANSPORT
PROPERTIES

FREDRICH J T; LINDQUIST W B
SANDIA NATIONAL LABS; TEXAS UNIV, AUSTIN
36TH US ROCK MECH INT SYMP (NYROCKS 97) (NEW YORK, NY,
6/29/1997-7/2/1997) PROC; INT J ROCK MECH MIN SCI V 34, NOS 3-4, APRIL-JUNE
1997 (ISSN 01489062; PAP NO 085; AVAILABLE ON CD-ROM; 13 PP; 13 REFS)

1997

ISSN: 0148-9062

LANGUAGE: ENGLISH

DOCUMENT TYPE: MEETING PAPER TEXT; AT; JOURNAL ARTICLE; J

Preliminary results of a study combining three-dimensional
imaging, extraction of statistical microgeometric descriptions from
volumetric image data, and experimental measurement of transport
properties of porous geomaterials are presented. High-
resolution (< 1 micron) three-dimensional image data are
obtained using laser scanning confocal microscopy. Image processing
techniques are first applied to segment the raw image data into solid
versus void space. The resulting binary data are then further processed to
extract quantitative statistical descriptions of first-order properties of
porous media such as porosity and specific surface area whereas more
complex aspects of the three-dimensional microgeometry are
characterized using the medial axis analysis. The derived microgeometric
descriptions are briefly considered in light of laboratory measurements of
fluid transport properties such as permeability. (c1997 Elsevier Science
Ltd

PRIMARY DESCRIPTOR: POROUS MEDIA

MAJOR DESCRIPTORS: FLUID FLOW; IMAGING; PERMEABILITY; PERMEABILITY (ROCK)
; PHYSICAL PROPERTY; PORE GEOMETRY; POROSITY; POROSITY (ROCK); RESERVOIR
FLUID FLOW

MINOR DESCRIPTORS: ANALYTICAL METHOD; ANISOTROPY; AREA; CHART;
CORRELATION; DATA; DATA PROCESSING; DIAGRAM; DIFFUSION; ELECTRICAL
EQUIPMENT; ELECTRONIC EQUIPMENT; EPOXY RESIN; EQUATION; EXPERIMENTAL DATA;
FACTOR; FLUORESCENCE; FORMATION RESISTIVITY FACT; GEOMETRY; GRAPH;
HISTOGRAM; IMPREGNATION; INSTRUMENT; ISOTROPY; KOZENY CARMEN EQUATION
; LABORATORY TESTING; LASER; LUMINESCENCE; MASER; MATHEMATICAL ANALYSIS;
MATHEMATICS; MICROSCOPE; MICROSCOPY; OPTICAL INSTRUMENT; OPTICAL PROPERTY;
POLYMER; PORE SIZE; PROBABILITY; ROCK; ROCK PROPERTY; SANDSTONE;
SEDIMENTARY ROCK; STATISTICAL ANALYSIS; SURFACE AREA; SYNTHETIC RESIN;
TABLE (DATA); TESTING; THREE DIMENSIONAL; TRANSPORT PROPERTY;
VOID

SUBJECT HEADING: RESERVOIR ENGINEERING & RECOVERY METHOD

28/9/19 (Item 3 from file: 987)
DIALOG(R) File 987:TULSA (Petroleum Abs)
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00992232 PETROLEUM ABSTRACTS NO.: 731020

EKOFISK FIELD REDEVELOPMENT: IMPROVED RESERVOIR MANAGEMENT THROUGH
CROSS-DISCIPLINE TECHNOLOGY AND INTEGRATION OF THREE
DIMENSIONAL MODELS

KEY S C; AGARWAL B; SOILAND G V; NIELSEN H H

PHILLIPS PETROL CO NORWAY

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10/26-29/1997) PROC V 2, PP 1147-1155, 1999 (ISBN 1-86239-039-8; COLOR; 7
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DOCUMENT TYPE: MEETING PAPER TEXT; AT

The Ekofisk field is currently undergoing a major field redevelopment in which 45 new wells will be drilled before the end of 1998. This requires that the most comprehensive and detailed reservoir description and geological and fluid flow models be used as the basis for the planning of such a redevelopment. This situation, as well as new developments in hardware and software and multidisciplinary database and applications integration, led to the decision in 1994 to completely reevaluate the reservoir characterization of the field. A major multidisciplinary effort involving geoscience, petrophysical and reservoir engineering work was initiated through the Ekofisk reservoir characterization project. Upscaling of the detailed description produced the highest resolution model that is computationally manageable. The resulting history-matched fluid flow model provides the primary reservoir management tool for the field redevelopment program and for the evaluation of reservoir and geoscience monitoring technologies. Down-scaled reservoir parameters are currently being integrated with petrophysical data and laboratory core analysis to drive seismic forward modeling of present and future reservoir conditions. These seismic simulations are being used to evaluate the implementation of a time-lapse seismic (4D) monitoring program for the field

PRIMARY DESCRIPTOR: EKOFISK OIL FIELD

MAJOR DESCRIPTORS: ADMINISTRATION; ATLANTIC OCEAN; BUSINESS OPERATION;
CHARACTERIZATION; CLASSIFICATION; FLOW MODEL; MANAGEMENT; MODEL; NORTH
ATLANTIC OCEAN; NORTH SEA; RESEARCH; RESERVOIR CHARACTERIZATION; RESERVOIR
MANAGEMENT; RESERVOIR MODEL; RESERVOIR STUDY; SEAS AND OCEANS; STUDY

MINOR DESCRIPTORS: ALGORITHM; ANISOTROPY; BOOK; CARBONATE RESERVOIR;
CARBONATE ROCK; CHALK; CHART; COMPUTER PROGRAMING; CORE ANALYSIS DATA;
CORRELATION; CRETACEOUS; DANIAN SERIES; DATA; DATA PROCESSING; DATABASE;
DEPTH CORRELATION; DIMENSIONAL MODEL; DYNAMIC PROGRAMING; EARTH AGE;
ECONOMIC FACTOR; ENHANCED RECOVERY; FACIES; FAULT (GEOLOGY); FAULT PATTERN;
FLOODING (FORMATION); FLOW CHART; FLUID FLOW; FORMATION

EVALUATION; GEOLOGIC STRUCTURE; GEOPHYSICAL DATA; GEOPHYSICAL
INTERPRETATION; HETEROGENEITY; INTEGRATED INTERPRETATION; INTERACTIVE
INTERPRETATION; INTERPRETATION; ISOTROPY; LIMESTONE; LIMESTONE
RESERVOIR; MAP; MATHEMATICAL ANALYSIS; MATHEMATICAL GRID; MATHEMATICS;
MESOZOIC; MULTIDISCIPLINARY STUDY; NUMERICAL ANALYSIS; OIL AND GAS FIELDS;
OIL FIELD; OIL RESERVE; PERMEABILITY; PERMEABILITY (ROCK); PHANEROZOIC;
PHYSICAL PROPERTY; PLANNING; PORE VOLUME; POROSITY; POROSITY
DISTRIBUTION; PROGRAMING; RELATIVE PERMEABILITY; RESERVE; RESERVOIR;
RESERVOIR FLUID FLOW; ROCK; SATURATION; SEDIMENTARY ROCK; SEISMIC DATA;
SEISMIC DATA PROCESSING; SEISMIC INTERPRETATION; SOFTWARE; STRATEGY;
STRUCTURE MAP; THREE DIMENSIONAL MODEL; TIME; TIME LAPSE;
VOLUME; WATER SATURATION; WATERFLOODING; WELL DATA; WELL LOG
INTERPRETATION

SUBJECT HEADING: RESERVOIR ENGINEERING & RECOVERY METHOD

28/9/20 (Item 4 from file: 987)

DIALOG(R)File 987:TULSA (Petroleum Abs)

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00960445 PETROLEUM ABSTRACTS NO.: 698678

RESERVOIR CHARACTERIZATION OF EKOFISK FIELD: A GIANT, FRACTURED CHALK
RESERVOIR IN THE NORWEGIAN NORTH SEA - HISTORY MATCH

AGARWAL B; HERMANSEN H; SYLTE J E; THOMAS L K
PHILLIPS PETROL CO UK LTD; PHILLIPS PETROL CO NORWAY; PHILLIPS PETROLEUM
CO

15TH SPE RESERVOIR SIMULATION SYMP (HOUSTON, 2/14-17/1999) PROC PP
161-172, 1999 (SPE-51893; 6 REFS)

1999

REPORT NUMBER: SPE-51893

LANGUAGE: ENGLISH

DOCUMENT TYPE: MEETING PAPER TEXT; AT

The history match of the 3-D fluid flow model constructed on the Ekofisk field is the focus of this study. The Ekofisk reservoir is a high porosity, low matrix permeability, naturally fractured chalk. A high-resolution simulation mesh was defined for the fluid flow model, and a flow-based upscaling technique was applied to preserve the heterogeneity from the geological to the fluid flow model. Because of the complexity of the Ekofisk field, with its numerous faults and fracture networks, anisotropy was one of the primary attributes manipulated to achieve an individual well and field history match. Faults and fault sealing factors, vertical permeability, pseudo relative permeability curves, bubble-point pressure correlations, local permeability and rock compressibility were also key parameters in the history match. A discussion on the preliminary implementation of water-induced compaction is included

PRIMARY DESCRIPTOR: EKOFISK OIL FIELD

MAJOR DESCRIPTORS: ATLANTIC OCEAN; CHARACTERIZATION; CLASSIFICATION; CORRELATION; FLOW MODEL; HISTORY MATCHING; MODEL; NORTH ATLANTIC OCEAN; NORTH SEA; RESEARCH; RESERVOIR CHARACTERIZATION; RESERVOIR MODEL; RESERVOIR STUDY; SEAS AND OCEANS; STUDY

MINOR DESCRIPTORS: ANISOTROPY; AQUIFER; BUBBLE POINT; CARBONATE RESERVOIR; CARBONATE ROCK; CHALK; CHART; COMPACTION (GEOLOGY); COMPOSITION; COMPRESSIBILITY; CRETACEOUS; DEFORMATION; DIAGENESIS; DIMENSIONAL MODEL; DIRECTIONAL PERMEABILITY; EARTH AGE; EKOFISK FM; EURASIA; EUROPE; FAULT (GEOLOGY); FAULTING; FISSURE (GEOLOGY); FLOW CAPACITY; FLOW UNIT; FLUID FLOW; FRACTURE (ROCK); FRACTURE CONDUCTIVITY; FRACTURE GEOMETRY; FRACTURED RESERVOIR; GAS LIQUID RATIO; GAS OIL RATIO; GEOLOGIC MODEL; GEOLOGIC STRUCTURE; GRAPH; HETEROGENEITY; HETEROGENEOUS RESERVOIR; HORIZONTAL PERMEABILITY; ISOTROPY; LIMESTONE; LIMESTONE RESERVOIR; LOW PERMEABILITY RESERVOIR; MAP; MATHEMATICAL ANALYSIS; MATHEMATICAL GRID; MATHEMATICAL MODEL; MATHEMATICS; MECHANICAL PROPERTY; MESOZOIC; MULTIZONE; NATURAL FRACTURE; NORWAY; NUMERICAL ANALYSIS; OIL AND GAS FIELDS; OIL FIELD; OIL RESERVOIR; PERMEABILITY; PERMEABILITY (ROCK); PHANEROZOIC; PHYSICAL PROPERTY; POST DEPOSITIONAL PROCESS; PRESSURE; PRODUCTION DECLINE CURVE; PRODUCTION LOGGING; RELATIVE PERMEABILITY; RESERVOIR; RESERVOIR FLUID FLOW; RESERVOIR PRESSURE; RESERVOIR ZONATION; ROCK; ROCK DEFORMATION; ROCK PROPERTY; SATURATION; SCALE UP; SEDIMENTARY ROCK; SIMULATION; SOLID COMPRESSIBILITY; STRUCTURE MAP; SUBSURFACE PRESSURE; THREE DIMENSIONAL MODEL; TIGHT FORMATION; TOR LIMESTONE; TRANSITION TEMPERATURE; VERTICAL PERMEABILITY; WATER OIL RATIO; WATER SATURATION; WELL LOGGING; ZONATION; ZONE (GEOLOGY)

SUBJECT HEADING: RESERVOIR ENGINEERING & RECOVERY METHOD

28/9/21 (Item 5 from file: 987)
DIALOG(R)File 987:TULSA (Petroleum Abs)
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00946095 PETROLEUM ABSTRACTS NO.: 685763

COMPUTED TOMOGRAPHY SCAN IMAGE ANALYSIS OF SEDIMENTS (ODP LEG 156)

ASHI J

TOKYO UNIV

PROCEEDINGS OF THE OCEAN DRILLING PROGRAM: SCIENTIFIC RESULTS V 156, PP 151-159; OCEAN DRILLING PROGRAM, TEXAS A&M UNIV, COLLEGE STATION, TX, NOV 1997 (ISSN 08845891; ALSO AVAILABLE ON CD-ROM; 23 REFS)

1997

ISSN: 0884-5891

LANGUAGE: ENGLISH

DOCUMENT TYPE: GOVERNMENT REPORT; GR; JOURNAL ARTICLE; J

Three-dimensional high-resolution images of

density distributions were obtained on unsplit cores using a medical X-ray computed tomography (CT) scanner. The resolution of CT scanning is ca 0.6 sq mm and allows a 5-mm depth for beam width. Electrical resistivity measurements were also conducted to know porosity at high depth resolution after core splitting. Whole-round core samples for this study were collected from sites 948 and 949 in the N. Barbados ridge accretionary prism during Ocean Drilling Program Leg 156. On the basis of the relationship between densities and linear attenuation coefficients of standard samples, densities derived from CT scans are consistent with densities by the mass/volume method of all samples irrespective of their compositions. Sample disturbance is easily detected in CT-scan images by convolutional texture in CT images perpendicular to core axes. This nondestructive technique provides reliable densities at high depth resolutions for evaluating disturbances by drilling or core splitting

PRIMARY DESCRIPTOR: NORTHWEST ATLANTIC OCEAN

MAJOR DESCRIPTORS: APPARENT RESISTIVITY; ATLANTIC OCEAN; BARBADOS RIDGE; ELECTRICAL PROPERTY; EXPLORATION; IMAGING; MARINE EXPLORATION; NORTH ATLANTIC OCEAN; PHYSICAL PROPERTY; POROSITY; POROSITY (ROCK); RESISTIVITY; SEAS AND OCEANS; TOMOGRAPHY

MINOR DESCRIPTORS: ACCRETIONARY WEDGE; ACCURACY; ANALYTICAL METHOD; ANISOTROPY; BEDDING; BEDDING PLANE; BOOK; CHART; CLAYSTONE; CLEAVAGE; COMPUTING; CORE (ROCK); CORE (SEDIMENT); CORE ANALYSIS; CROSSHOLE METHOD; DEEP SEA DRILLING PROJECT; DENSITY; DRILLING (WELL); ELECTRICAL CONDUCTIVITY; EQUATORIAL ATLANTIC OCEAN; EXPLORATORY DRILLING; EXPLORATORY WELL; FACTOR; FISSURE (GEOLOGY); FORMATION RESISTIVITY FACT; FRACTURE (ROCK); GEOLOGIC STRUCTURE; GEOLOGY; GOVERNMENT PROJECT; GRAIN PROPERTY; GRAIN SIZE (GEOLOGY); GRAPH; IPOD; ISOTROPY; JOIDES; LITHOLOGY; MATHEMATICS; MICROFRACTURE (ROCK); OCEAN DRILLING PROGRAM; PHOTOGRAPH; PROCEDURE; RESOLUTION; RIDGE (GEOLOGY); ROCK; ROCK ANALYSIS; ROCK CLEAVAGE; ROCK DENSITY; ROCK SAMPLE; SAMPLE; SEA FLOOR; SEDIMENT ANALYSIS; SEDIMENT SAMPLE; SEDIMENTARY ROCK; SEDIMENTARY STRUCTURE; SUBMARINE TOPOGRAPHY; TESTING; THREE DIMENSIONAL; TOPOGRAPHY; UNDERWATER TOPOGRAPHY; WELL; X RAY ANALYSIS

SUBJECT HEADING: GEOLOGY

28/9/22 (Item 1 from file: 35)
DIALOG(R)File 35:Dissertation Abs Online
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01934590 ORDER NO: AADAA-I3079545
Forward-viewing ring annular array in intravascular ultrasound imaging
Author: Wang, Yao
Degree: Ph.D.
Year: 2003
Corporate Source/Institution: University of Michigan (0127)
Chair: Matthew O'Donnell
Source: VOLUME 64/02-B OF DISSERTATION ABSTRACTS INTERNATIONAL.
PAGE 831. 224 PAGES
Descriptors: ENGINEERING, BIOMEDICAL
Descriptor Codes: 0541

Cardiovascular disease is the leading cause of death in our society. Intravascular ultrasound (IVUS) is now an established modality in the management of coronary artery disease. However, conventional IVUS systems using circumferential arrays fire beams orthogonal to the main axis of the mounting catheter. The system produces high resolution cross-sectional images but must be guided by conventional X-ray angiography. A real-time forward-viewing array, integrated into the same catheter, could greatly reduce radiation exposure from angiographic guidance. Unfortunately, the mounting requirement of a catheter guide wire prohibits a full-disk imaging aperture. Given only an annulus of array elements, this dissertation discusses a design that uses a total of 210 transceiver firings with synthetic beamforming for a given 3-D image frame. Simulation results demonstrate this design can achieve side-lobes near -40 dB for on-axis situations and

about -30 dB for steering to the edge of a 60° cone.

A scheme, called Coded EXcitation with Spectrum Inversion (CEXSI) has been proposed to improve SNR in this system. An established optimal binary code whose spectrum has no nulls and possesses the least variation is used for transmission. Decoding is a simple matter of spectrum inversion. Various transmission techniques can be employed to improve energy coupling within the transducer pass-band. CEXSI has the potential to achieve very low (-80 dB) side-lobes. For a 2.6μ s code, an array element on the ring-annular array with a center frequency of 10 MHz and fractional bandwidth of 38%, range side-lobes of about -40 dB have been achieved experimentally with a negligible compromise in range resolution. SNR improvement also has been characterized at about 14 dB.

The 3-D data set from such an array opens up opportunities for compounding in both axial and lateral directions. To explore this potential, simulation studies analyzing 3-D ultrasound data from various phantom geometries have been performed. For a vessel phantom, the results indicate compounding could boost contrast to noise ratio (CNR) (up to a factor of 4 in the results) without a significant compromise in image resolution. For an isotropic cyst phantom, axial and lateral compounding perform similarly. Such improvement should be helpful for guidance in interventional procedures.

Initial experiments have been performed on a prototype ultra-sparse array. The results so far demonstrated the potential of the system.

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DIALOG(R)File 35:Dissertation Abs Online
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01802777 ORDER NO: AADAA-INQ40270
THE STUDY AND ANALYSIS OF SOFT TISSUE MECHANICS: APPLICATION OF A 3D
DYNAMIC COMPUTED TOMOGRAPHY SCANNER FOR VASCULAR IMAGING
Author: LEE, MARK K.
Degree: PH.D.
Year: 1999
Corporate Source/Institution: THE UNIVERSITY OF WESTERN ONTARIO (CANADA)
(0784)
Advisers: AARON FENSTER; DAVID HOLDSWORTH
Source: VOLUME 60/08-B OF DISSERTATION ABSTRACTS INTERNATIONAL.
PAGE 4082. 197 PAGES
Descriptors: ENGINEERING, BIOMEDICAL
Descriptor Codes: 0541
ISBN: 0-612-40270-3

A novel *2D* and *3D* dynamic computed-tomography (CT) scanner has been developed for imaging objects undergoing periodic motion. The scanner system has high spatial and sufficient temporal resolution to produce quantitative tomographic/volume images of objects such as excised arterial samples perfused under physiological pressure conditions and enables the measurement of the local dynamic elastic modulus *E_{dyn}* of the arteries in the axial and longitudinal directions.

These systems were comprised of a high resolution modified x-ray image intensifier (XRII) based computed tomographic system and a computer-controlled cardiac flow simulator. A 1024 element linear photo diode array was coupled to the electro-optically zoomed XRII in the *2D* system, while a standard NTSC CCD camera with a macro lens was utilized in the full volume *3D* system. Through prospective cardiac gating and computer control, a time-resolved sequence of 1 *mm* thick high resolution axial tomographic slices and 20 *mm* thick volume images of porcine aortic specimens during one simulated cardiac cycle were obtainable from the *2D* and *3D* systems respectively.

Performance evaluation of the scanners illustrated that tomographic images can be obtained with resolution as high as

3.2 *mm*¹ with only a 9% decrease in the resolution for objects moving at velocities of 1 *cm/s* for the *2D* system and static spatial resolution of 3.55 *mm*¹ with only a 14% decrease in the resolution for the *3D* system for objects moving at a velocity of 10 *cm/s*.

Application of the system for imaging of intact excised arterial specimens under simulated physiological flow/pressure conditions enabled measurements of the *E_{dyn}* of the arteries with a precision of ± 8 *kPa* and ± 10 *kPa* for the *2D* and *3D* scanners, respectively. Evaluation of the *E_{dyn}* in the axial and longitudinal direction produced values of 428 ± 35 *kPa* and 728 ± 71 *kPa*, demonstrating the isotropic and homogeneous nature of the vascular specimens.

To enable the investigation of the stress relaxation spectrum of the porcine aortic valve leaflet, a high-speed hydraulic uniaxial material testing system and accompanying high-speed data acquisition system was built. testing strain rates in the order of 400%/s were achievable and the initial (1/100 s) relaxation period of the aortic valve was identified. The stress relaxation spectrum data exhibited two prominent clusters of relaxation constants at 10^{-1} and 10^{-2} indicating a relaxation difference of four orders of magnitude. This suggest two unique tissue relaxation processes, a rapid response to impulse strains and a slower stress re-distribution for the final equilibrium relaxation. Modeling of this stress relaxation behavior was implemented by a numeric simulation of classic Quasi-Linear Viscoelasticity (QLV) theory with modifications to the reduce relaxation function and the addition of a fiber recruitment function.

The recruitment function which reflects the process of elastic/viscous rearrangement of random fibers through the inter-interfibrillar matrix was implemented into the QLV model. This introduction of anisotropy, accounts for the non-uniform angular distribution within the tissue and consequently the directional preference of its mechanical properties. Additionally, correlation to the actual tissue structure and function may be derived from the analysis of the parameters. (Abstract shortened by UMI.)

28/9/24 (Item 3 from file: 35)
DIALOG(R)File 35:Dissertation Abs Online
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01715172 ORDER NO: AADAA-I0800404
Electron microscopic investigation of interfaces in materials for orthopedic applications
Author: Benezra, Valarie Ilene
Degree: Ph.D.
Year: 1998
Corporate Source/Institution: Massachusetts Institute of Technology (0753)
Supervisor: Linn W. Hobbs
Source: VOLUME 60/10-B OF DISSERTATION ABSTRACTS INTERNATIONAL.
PAGE 5189.
Descriptors: ENGINEERING, MATERIALS SCIENCE ; ENGINEERING, BIOMEDICAL ; HEALTH SCIENCES, MEDICINE AND SURGERY
Descriptor Codes: 0794; 0541; 0564

About 250,000 people undergo knee and hip arthroplasty each year in North America alone, with hundreds of thousands more receiving joints over the rest of the world. Two factors are key to the success of these implants. First, the quality of attachment of the prosthetic joint to the patient's bone, and second, the low generation of wear particles as the components of the prosthesis articulate against each other.

This thesis is a study of both of these factors. First, the mechanism of bone apposition to hydroxyapatite coatings on Ti-6Al-4V was investigated via transmission electron microscopy (TEM). In this section of the study, Ti alloy cylinders were coated with hydroxyapatite by two different methods to yield three types of coatings—annealed and unannealed plasma-spray (PSHA) coatings and an annealed ion-beam assisted deposited (IBAD-HA) coating. These cylinders were implanted in trabecular bone in dogs from periods ranging from 3 hours to 14 days. Mechanical testing indicated that the bone/implant interface with the PSHA coated implants was significantly stronger than that with the IBAD-HA coated or uncoated Ti alloy implants. However, there were no differences in the degree of bone apposition to the three HA-coated materials; thus indicating that bone apposition is not a sufficient indicator of mechanical integrity of the bone/HA interface.

In the second section of this study, the microstructural factors contributing to the observed wear properties of the oxide on Zr-2.5Nb were investigated via TEM. Zr-2.5Nb barstock which had been rotary-forged to impart an anisotropic microstructure was sectioned and oxidized in dry air at 600°C and 635°C for a variety of times ranging from 30 minutes to 40 hours. Cross-sections across the oxide/metal interface were observed via TEM. The oxide scale comprises primarily monoclinic zirconia, with small amounts of tetragonal zirconia. Evidence of a mixed oxide phase, $6ZrO_2 \cdot Nb_2O_5$, was also observed. The microstructure of this oxide is dependent on oxidation temperature, the microstructure of the underlying metal, and oxide depth. Two oxide microstructures originating from beta-Zr grains in the alloy were also identified.

A third study concerned the architecture and microstructure of naturally-derived and synthetic bone substitute materials (BSMs). While BSMs are used clinically to promote healing in large bone defects, they were useful to this study as a control for the organization of mineral in mature bone. Low voltage high resolution scanning electron microscopy (LVHRSEM) enabled observations of the three dimensional architecture of these materials which were then correlated with TEM observations. The crystallites in an anorganic bovine-derived BSM were organized in a hierarchical fashion which paralleled the organization of collagen. In contrast, the synthetic materials were organized in an isotropic network. The difference in organization was attributed to the formation of the mineral matrix of bone on an anisotropic collagen template. (Copies available exclusively from MIT Libraries, Rm. 14-0551, Cambridge, MA 02139-4307. Ph. 617-253-5668; Fax 617-253-1690.)

28/9/25 (Item 1 from file: 144)
DIALOG(R) File 144:Pascal
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15755274 PASCAL No.: 02-0467645
Time-resolved contrast-enhanced imaging with isotropic resolution
and broad coverage using an undersampled 3D projection trajectory
BARGER Andrew V; BLOCK Walter F; TOROPOV Yuriy; GRIST Thomas M; MISTRETTA
Charles A

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United States; Department of Medical Physics, University of Wisconsin,
Madison, Wisconsin, United States; Department of Biomedical Engineering,
University of Wisconsin, Madison, Wisconsin, United States; Department of
Radiology, University of Wisconsin, Madison, Wisconsin, United States

Journal: Magnetic resonance in medicine, 2002, 48 (2) 297-305
ISSN: 0740-3194 CODEN: MRMEEN Availability: INIST-20644;
354000108938660100

No. of Refs.: 36 ref.
Document Type: P (Serial) ; A (Analytic)
Country of Publication: United States
Language: English

Time-resolved contrast-enhanced 3D MR angiography (MRA) methods
have gained in popularity but are still limited by the tradeoff between
spatial and temporal resolution. A method is presented that greatly reduces
this tradeoff by employing undersampled 3D projection reconstruction

trajectories. The variable density k-space sampling intrinsic to this sequence is combined with temporal k-space interpolation to provide time frames as short as 4 s. This time resolution reduces the need for exact contrast timing while also providing dynamic information. Spatial resolution is determined primarily by the projection readout resolution and is thus isotropic across the FOV, which is also isotropic. Although undersampling the outer regions of k-space introduces aliased energy into the image, which may compromise resolution, this is not a limiting factor in high-contrast applications such as MRA. Results from phantom and volunteer studies are presented demonstrating isotropic resolution, broad coverage with an isotropic field of view (FOV), minimal projection reconstruction artifacts, and temporal information. In one application, a single breath-hold exam covering the entire pulmonary vasculature generates high-resolution, isotropic imaging volumes depicting the bolus passage.

English Descriptors: Nuclear magnetic resonance imaging; Angiography; 3D imaging; Contrast threshold; Optimization; Spatial resolution; Time resolution; Image reconstruction; Signal processing; Test object; Lung; Pulmonary artery

Broad Descriptors: Respiratory system; Appareil respiratoire; Aparato respiratorio

French Descriptors: Imagerie RMN; Angiographie; Formation image tridimensionnelle; Seuil contraste; Optimisation; Resolution spatiale; Resolution temporelle; Reconstruction image; Traitement signal; Objet test; Poumon; Artere pulmonaire

Classification Codes: 002B24A02; 002B24A03

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28/9/26 (Item 2 from file: 144)
DIALOG(R) File 144:Pascal
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14910684 PASCAL No.: 01-0060227
Dyanmic 3D computed tomography scanner for vascular imaging
Physics of medical imaging : San Diego CA, 13-15 February 2000
LEE Mark K; HOLDSWORTH David W; FENSTER Aaron
DOBBINS James T, ed; BOONE John M, ed
The J.P. Robarts Research Institute, London, Ontario, Canada; Department of Engineering Science, The University of Western Ontario, London, Ontario, Canada; Department of Medical Biophysics, The University of Western Ontario, London, Ontario, Country, Canada
Physics of medical imaging. Conference (San Diego CA USA) 2000-02-13
Journal: SPIE proceedings series, 2000, 3977 364-375
ISBN: 0-8194-3594-5 ISSN: 1017-2653 Availability: INIST-21760;
354000092006510380
No. of Refs.: 20 ref.
Document Type: P (Serial); C (Conference Proceedings) ; A (Analytic)
Country of Publication: United States
Language: English
A 3D dynamic computed-tomography (CT) scanner was developed for imaging objects undergoing periodic motion. The scanner system has high spatial and sufficient temporal resolution to produce quantitative tomographic/volume images of objects such as excised arterial samples perfused under physiological pressure conditions and enables the measurements of the local dynamic elastic modulus ($E_{SUB d SUB y SUB n}$) of the arteries in the axial and longitudinal directions. The system was comprised of a high resolution modified x-ray image intensifier (XRII) based computed tomographic system and a computer-controlled cardiac flow simulator. A standard NTSC CCD camera with a macro lens was coupled to the electro-optically zoomed XRII to acquire dynamic volumetric images. Through prospective cardiac gating and computer synchronized control, a time-resolved sequence of 20 mm thick high

resolution volume images of porcine aortic specimens during one simulated cardiac cycle were obtained. Performance evaluation of the scanners illustrated that tomographic images can be obtained with resolution as high as 3.2 mm SUP - SUP 1 with only a 9 % decrease in the resolution for objects moving at velocities of 1 cm/s in 2D mode and static spatial resolution of 3.55 mm SUP - SUP 1 with only a 14 % decrease in the resolution in 3D mode for objects moving at a velocity of 10 cm/s. Application of the system for imaging of intact excised arterial specimens under simulated physiological flow/pressure conditions enabled measurements of the E SUB d SUB y SUB n of the arteries with a precision of ± 10 kPa for the 3D scanner. Evaluation of the E SUB d SUB y SUB n in the axial and longitudinal direction produced values of 428 ± 35 kPa and 728 ± 71 kPa, demonstrating the isotropic and homogeneous viscoelastic nature of the vascular specimens. These values obtained from the Dynamic CT systems were not statistically different ($p < 0.05$) from the values obtained by standard uniaxial tensile testing and volumetric measurements.

English Descriptors: Computerized axial tomography; Angiography; 3D imaging; Technique; Performance evaluation; Spatial resolution; Time resolution; Quantitative analysis; Volumetric analysis; Artery; In vitro; Viscoelasticity; Medical application

Broad Descriptors: Radiodiagnosis; Medical imagery; Radiodiagnostic; Imagerie medicale; Radiodiagnostico; Imageria medical

French Descriptors: Tomodensitometrie; Angiographie; Formation image tridimensionnelle; Technique; Evaluation performance; Resolution spatiale; Resolution temporelle; Analyse quantitative; Volumetrie; Artere; In vitro; Viscoelasticite; Application medicale

Classification Codes: 002B24A03

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28/9/27 (Item 1 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci
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10029187 Genuine Article#: 474YF Number of References: 63
Title: A priori field study of the subgrid-scale heat fluxes and dissipation in the atmospheric surface layer
Author(s): Porte-Agel F; Parlange MB (REPRINT) ; Meneveau C; Eichinger WE
Corporate Source: Johns Hopkins Univ, Dept Geog & Environm Engn, 313 Ames Hall/Baltimore//MD/21218 (REPRINT); Univ Minnesota, Dept Civil Engn, Minneapolis//MN/; Univ Minnesota, St Anthony Falls Lab, Minneapolis//MN/; Johns Hopkins Univ, Dept Geog & Environm Engn, Baltimore//MD/21218; Johns Hopkins Univ, Ctr Environm & Appl Fluid Mech, Dept Mech Engn, Baltimore//MD/21218; Univ Iowa, Iowa Inst Hydraul Res, Dept Civil & Environm Engn, Iowa City//IA/
Journal: JOURNAL OF THE ATMOSPHERIC SCIENCES, 2001, V58, N18, P2673-2698
ISSN: 0022-4928 Publication date: 20010000
Publisher: AMER METEOROLOGICAL SOC, 45 BEACON ST, BOSTON, MA 02108-3693 USA
Language: English Document Type: ARTICLE
Geographic Location: USA
Journal Subject Category: METEOROLOGY & ATMOSPHERIC SCIENCES
Abstract: Field measurements are carried out to study statistical properties of the subgrid-scale (SGS) heat fluxes and SGS dissipation of temperature variance in the atmospheric surface layer, and to evaluate the ability of several SGS models to reproduce these properties. The models considered are the traditional eddy-diffusion model, the nonlinear (gradient) model, and a mixed model that is a linear combination of the other two. High-resolution wind velocity and temperature fields are obtained from arrays of 3D sonic anemometers placed in the surface layer. The basic setup consists of two horizontal parallel arrays (seven sensors in the

lower array and five sensors in the upper array) at different heights (2.4 and 2.9 m, respectively). Data from this setup are used to compute the SGS heat flux and dissipation of temperature variance by means of 2D filtering in horizontal planes, invoking Taylor's hypothesis. Model coefficients are measured from the data by requiring the real and modeled time-averaged dissipation rates to match. Various other experimental setups that differ mainly in the separation between the sensors are utilized to show that filter size has a considerable effect on the various model coefficients near the ground. For the basic setup, conditional averaging is used to study the relation between large-scale coherent structures (sweeps and ejections) and the SGS quantities. It is found that under unstable conditions, negative SGS dissipation, indicative of backscatter of temperature variance from the subgrid scales to the resolved field, is most important during the onset of ejections transporting relatively warm air upward. Large positive SGS dissipation of temperature variance is associated with the end of ejections (and/or the onset of sweeps) characterized by strong drops in temperature and vertical velocity under unstable conditions. These results are also supported by conditionally sampled 2D (streamwise and vertical) velocity and temperature distributions, obtained using an additional setup consisting of the 12 anemometers placed in a vertical array. The nonlinear and mixed model reproduce the observations better than the eddy-diffusion model.

Identifiers--KeyWord Plus(R): LARGE-EDDY-SIMULATION; PLANETARY BOUNDARY-LAYER; ENERGY-TRANSFER; TURBULENT-FLOW; STOCHASTIC BACKSCATTER; ISOTROPIC TURBULENCE; DECIDUOUS FOREST; COMPLEX TERRAIN; MODEL; TEMPERATURE

Cited References:

31/9/1 (Item 1 from file: 155)
 DIALOG(R) File 155:MEDLINE(R)
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11995547 PMID: 12210938

Time-resolved contrast-enhanced imaging with isotropic resolution and broad coverage using an undersampled 3D projection trajectory.

Barger Andrew V; Block Walter F; Toropov Yuriy; Grist Thomas M; Mistretta Charles A

Department of Physics, University of Wisconsin, Madison, USA.

Magnetic resonance in medicine - official journal of the Society of Magnetic Resonance in Medicine / Society of Magnetic Resonance in Medicine (United States) Aug 2002, 48 (2) p297-305, ISSN 0740-3194

Journal Code: 8505245

Contract/Grant No.: 1R01-HL62425; HL; NHLBI; HL62425-01; HL; NHLBI

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

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Subfile: INDEX MEDICUS

Time-resolved contrast-enhanced 3D MR angiography (MRA)

Methods have gained in popularity but are still limited by the tradeoff between spatial and temporal resolution. A method is presented that greatly reduces this tradeoff by employing undersampled 3D projection reconstruction trajectories. The variable density k-space sampling intrinsic to this sequence is combined with temporal k-space interpolation to provide time frames as short as 4 s. This time resolution reduces the need for exact contrast timing while also providing dynamic information. Spatial resolution is determined primarily by the projection readout resolution and is thus isotropic across the FOV, which is also isotropic. Although undersampling the outer regions of k-space introduces aliased energy into the image, which may compromise resolution, this is not a limiting factor in high-contrast applications such as MRA. Results from phantom and volunteer studies are

presented demonstrating isotropic resolution, broad coverage with an isotropic field of view (FOV), minimal projection reconstruction artifacts, and temporal information. In one application, a single breath-hold exam covering the entire pulmonary vasculature generates high-resolution, isotropic imaging volumes

depicting the bolus passage. Copyright 2002 Wiley-Liss, Inc.

Tags: Human; Support, Non-U.S. Gov't; Support, U.S. Gov't, Non-P.H.S.; Support, U.S. Gov't, P.H.S.

Descriptors: Contrast Media; *Gadolinium DTPA--diagnostic use--DU; *Imaging, Threes-Dimensional--methods--MT; *Magnetic Resonance Angiography--methods--MT; Abdomen--blood supply--BS; Artifacts; Image Processing, Computer-Assisted; Phantoms, Imaging; Thorax --blood supply--BS

CAS Registry No.: 0 (Contrast Media); 80529-93-7 (Gadolinium DTPA)

Record Date Created: 20020904

Record Date Completed: 20021008

31/9/2 (Item 2 from file: 155)

DIALOG(R)File 155:MEDLINE(R)

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11971547 PMID: 12185063

Serial isotropic three-dimensional fast FLAIR imaging: using image registration and subtraction to reveal active multiple sclerosis lesions.

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AJR. American journal of roentgenology (United States) Sep 2002, 179

(3) p777-82, ISSN 0361-803X Journal Code: 7708173

Document type: Clinical Trial; Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: Completed

Subfile: AIM; INDEX MEDICUS

OBJECTIVE: Image registration and subtraction to detect the change of disease burden in multiple sclerosis on serial MR images should benefit from the use of high-resolution isotropic voxels. We compared 1.2-mm isotropic three-dimensional (3D) fast fluid-attenuated inversion recovery (FLAIR) images with standard 3-mm two-dimensional spin-echo images for the detection of new or enlarging lesions in longitudinal studies. SUBJECTS AND METHODS: Serial MR images were obtained at baseline, month 6 (n = 20), and month 7 (n = 16). For the half-yearly intervals, subtracted 3D FLAIR images and T2-weighted spin-echo images were compared. For the monthly intervals, subtracted 3D

FLAIR images were compared with triple-dose contrast-enhanced T1-weighted spin-echo images. New, enlarging, and enhancing lesions were marked in consensus by two radiologists. RESULTS: At the half-yearly intervals, 3D FLAIR imaging detected more new or enlarging lesions than T2-weighted spin-echo imaging, both at the initial interpretation (80 vs 52; $p < 0.001$) and after a side-by-side comparison of the lesions (88 vs 65; $p < 0.001$). Post hoc analyses showed the largest benefit for new (rather than enlarging), for small, and for temporal lesions. At the monthly intervals, 32 enhancing lesions were detected on contrast-enhanced T1-weighted spin-echo images versus 20 new or enlarging lesions detected on 3D FLAIR images ($p < 0.05$). After a side-by-side comparison of the lesions, seven additional lesions were identified on 3D FLAIR images, making the difference with contrast-enhanced T1-weighted spin-echo images insignificant (27 vs 32; $p > 0.05$). CONCLUSION: Isotropic 3D FLAIR imaging holds great promise for the detection of new or enlarging lesions in multiple sclerosis using registration and subtraction techniques certainly at longer intervals.

Tags: Comparative Study; Female; Human; Male

Descriptors: Echo-Planar Imaging; *Imaging, Three-Dimensional; *Magnetic Resonance Imaging; *Multiple Sclerosis
--pathology--PA; Adult; Brain--pathology--PA; Brain--physiopathology--PP;
Disease Progression; Longitudinal Studies; Middle Aged; Multiple Sclerosis
--physiopathology--PP; Sensitivity and Specificity; Time Factors
Record Date Created: 20020819
Record Date Completed: 20020910

31/9/3 (Item 3 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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11913354 PMID: 12110725
Search for isotropic resolution in CT from conventional through multiple-row detector.
Mahesh Mahadevappa
Russell H. Morgan Department of Radiology and Radiological Sciences, Johns Hopkins University School of Medicine, 601 N Caroline St, Baltimore, MD 21287-0856, USA. mmahesh@jhmi.edu
Radiographics - a review publication of the Radiological Society of North America, Inc (United States) Jul-Aug 2002, 22 (4) p949-62, ISSN 0271-5333 Journal Code: 8302501
Document type: Journal Article; Review; Review, Tutorial
Languages: ENGLISH
Main Citation Owner: NLM
Record type: Completed
Subfile: INDEX MEDICUS
Computed tomography (CT) is a method of acquiring and reconstructing the image of a thin cross section on the basis of measurements of attenuation. In comparison with conventional radiographs, CT images are free of superimposing tissues and are capable of much higher contrast due to elimination of scatter. Most of the developments in CT since its introduction can be considered as attempts to provide faster acquisition times, better spatial resolution, and shorter computer reconstruction times. From the early designs, the technology progressed with faster scanning times and higher scanning plane resolution, but true three-dimensional (3D) imaging became practical only with helical scanning capabilities. The recent advent of multiple-row detector helical scanners has the capability to produce 3D images that approach the ideal of a true "3D radiograph." Current multiple-row detector scanners can scan 40-cm volume lengths in less than 30 seconds with near-isotropic resolution and image quality that could not be envisioned at the time of Hounsfield's invention. Copyright RSNA, 2002 (27 Refs.)
Tags: Human
Descriptors: *Tomography, X-Ray Computed--methods--MT; Algorithms; Physics; Radiographic Image Enhancement; Tomography, X-Ray Computed--instrumentation--IS
Record Date Created: 20020711
Record Date Completed: 20021108

31/9/4 (Item 1 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)
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06755150 E.I. No: EIP04118058810
Title: Modeling anisotropic undersampling of magnetic resonance angiographies and reconstruction of a high-resolution isotropic volume using half-quadratic regularization techniques
Author: Rouillot, Elodie; Herment, Alain; Bloch, Isabelle; De Cesare, Alain; Nikolova, Mila; Mousseaux, Elie
Corporate Source: Departement TSI CNRS UMR 5141 LTCI Ecl. Natl. Sup. des Telecom., 75013 Paris, France
Source: Signal Processing v 84 n 4 April 2004. p 743-762

Publication Year: 2004

CODEN: SPRODR ISSN: 0165-1684

Language: English

Document Type: JA; (Journal Article) Treatment: T; (Theoretical)

Journal Announcement: 0403W4

Abstract: In this paper we address the problem of reconstructing a high resolution volumic image from several low resolution data sets. A solution to this problem is proposed in the particular framework of magnetic resonance angiography (MRA), where the resolution is limited by a trade-off between the spatial resolution and the acquisition time, both being proportional to the number of samples acquired in k-space. For this purpose only the meaningful spatial frequencies of the 3D k-space of the vessel are acquired, which is achieved using successive acquisitions with decreased spatial resolution, leading to highly anisotropic data sets in one or two specific directions. The reconstruction of the MRA volume from these data sets relies on an edge-preserving regularization method and leads to two different implementations: the first one is based on a conjugate gradient algorithm, and the second one on half-quadratic developments. The hyper parameters of the method were experimentally determined using a set of simulated data, and promising results were obtained on aorta and carotid artery acquisitions, where on the one hand a good fidelity to the acquired data is maintained, and on the other hand homogeneous areas are smooth and edges are well preserved. Half-quadratic regularization proved to be particularly well adapted to the MRA problem and leads to a fast iterative algorithm requiring only scalar and FFT computations. copy 2003 Elsevier B.V. All rights reserved. 30 Refs.

Descriptors: *Signal reconstruction; Angiography; Magnetic resonance; Anisotropy; Data acquisition; Algorithms

Identifiers: Magnetic resonance angiography; High-resolution; Undersampling; Edge-preserving regularization; Half-quadratic regularization

Classification Codes:

716.1 (Information & Communication Theory); 461.6 (Medicine); 701.2 (Magnetism, Basic Concepts & Phenomena); 931.2 (Physical Properties of Gases, Liquids & Solids); 723.2 (Data Processing)

716 (Electronic Equipment, Radar, Radio & Television); 461 (Bioengineering); 701 (Electricity & Magnetism); 931 (Applied Physics Generally); 723 (Computer Software, Data Handling & Applications)

71 (ELECTRONICS & COMMUNICATION ENGINEERING); 46 (BIOENGINEERING); 70 (ELECTRICAL ENGINEERING, GENERAL); 93 (ENGINEERING PHYSICS); 72 (COMPUTERS & DATA PROCESSING)

31/9/5 (Item 1 from file: 34)

DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

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10822883 Genuine Article#: 572NF Number of References: 27

Title: The AAPM/RSNA physics tutorial for residents - Search for isotropic resolution in CT from conventional through multiple-row detector

Author(s): Mahesh M (REPRINT)

Corporate Source: Johns Hopkins Univ,Sch Med, Dept Radiol & Radiol Sci,601 N Caroline St/Baltimore//MD/21287 (REPRINT); Johns Hopkins Univ,Sch Med , Dept Radiol & Radiol Sci,Baltimore//MD/21287

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ISSN: 0271-5333 **Publication date:** 20020700

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Geographic Location: USA

Journal Subject Category: RADIOLOGY, NUCLEAR MEDICINE & MEDICAL IMAGING

Abstract: Computed tomography (CT) is a method of acquiring and reconstructing the image of a thin cross section on the basis of measurements of attenuation. In comparison with conventional radiographs, CT images are free of superimposing tissues and are

capable of much higher contrast due to elimination of scatter. Most of the developments in CT since its introduction can be considered as attempts to provide faster acquisition times, better spatial resolution, and shorter computer reconstruction times. From the early designs, the technology progressed with faster scanning times and higher scanning plane resolution, but true three-dimensional (3D) imaging became practical only with helical scanning capabilities. The recent advent of multiple-row detector helical scanners has the capability to produce 3D images that approach the ideal of a true "3D radiograph." Current multiple-row detector scanners can scan 40-cm volume lengths in less than 30 seconds with near-isotropic resolution and image quality that could not be envisioned at the time of Hounsfield's invention.

Descriptors--Author Keywords: computed tomography (CT) ; computed tomography (CT), helical ; computed tomography (CT), high-resolution ; computed tomography (CT), multi-detector row ; computed tomography (CT), physics ; computed tomography (CT), technology ; computed tomography (CT), thin-section ; computed tomography (CT), three-dimensional

Identifiers--KeyWord Plus(R): MULTISLICE HELICAL CT; SPIRAL CT; RECONSTRUCTION; TOMOGRAPHY; SCANNER; SINGLE

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Set	Items	Description
S1	250373	ISOTROP??????
S2	544254	HIGH()RESOLUTION??
S3	664565	(HIGH OR HIGHER OR HIGHEST OR IMPROVED OR BETTER OR ENHANC?????) (2N)RESOLUTION??
S4	3267	1AND2
S5	3964	1AND3
S6	175	S5 AND VOXEL??
S7	731	S5 AND ((THREE OR 3)()) (D OR DIMENSION???? OR AXIS OR AXES) OR 3D)
S8	116	6AND7
S9	196	S7 AND VOLUM???????
S10	197	S8:S9 AND (MRI OR IMAGING)
S11	100	S8:S9 AND CONTRAST?????

S12	197	S8:S9 AND (IMAGE OR IMAGES OR IMAGED)
S13	7	S8:S9 AND (FORMATION OR FORMING OR CREATING OR CREATION)
S14	223	S10 OR S12
S15	87	11AND14
S16	93	S13 OR S15
S17	49	RD S16 (unique items)
S18	79	S6:S7 AND (MATRIX???? OR MATRICES OR ARRAY????)
S19	4	S18 AND ORTHOGON???????
S20	14	S18 AND SLICE???
S21	26	S18 AND SCANN????
S22	0	S18 AND UNKNOWN???
S23	8	S18 AND RELATIVE??
S24	1	S18 AND RELATION
S25	2	S18 AND RESPECT
S26	6	S17 AND (MATRIX???? OR MATRICES OR ARRAY????)
S27	45	S13 OR S19:S26
S28	27	RD S27 (unique items)
S29	15	S11:S21 AND ISOTROP???????/TI
S30	13	S29 NOT S27
S31	5	RD S30 (unique items)